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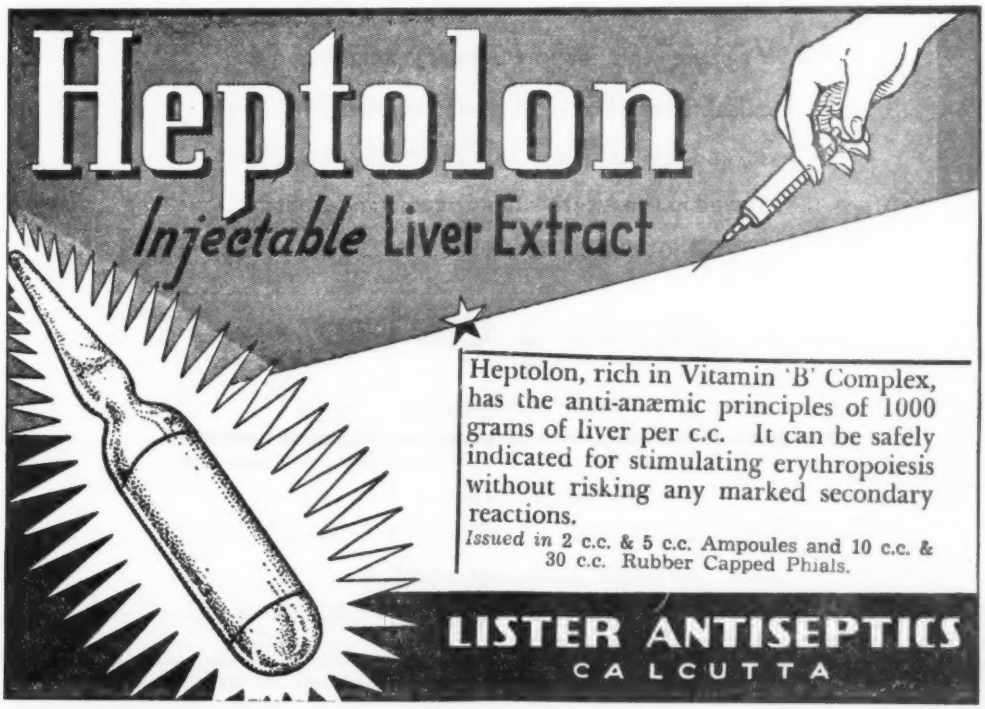
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SOME EPIDEMIOLOGICAL FACTORS OF GUINEA-WORM DISEASE AS NOTICED IN A RECENT SURVEY OF THE OSMANABAD DISTRICT

S. RAGHAVENDER RAO, L.M.S. (HYD.), D.T.M., D.P.H., D.SC. (CAL.),
H. E. H. the Nizam's Medical & Public Health Department
Hyderabad-Deccan

Object of the Present Survey

The present survey was undertaken to find out the extent of the disease in the Osmanabad district as a whole and also in the various taluks. The aim of the survey was also to collect data regarding the factors known and still unknown concerning the epidemiology of this crippling but fortunately non-fatal disease. A report of the existing condition of the sources of drinking water-supply particularly with regard to their infestation with cyclops and the effects on cyclops of disinfection of wells with different kinds of lime was also brought under the scope of this survey.

Method of Survey

In every one of the taluks, villages to be surveyed were selected in such a manner as to form a fair sample of the conditions prevailing in that taluk regarding social, environmental and physical characteristics. Ninetyone villages were selected in this manner and their distribution according to taluks was as follows:—

Tuljapur taluk	..	23 villages
Parenda taluk	..	23 villages
Kallam taluk	..	23 villages
Latur taluk	..	9 villages
Osmanabad taluk	..	13 villages

A house to house visit was made in each village surveyed and the names of persons who suffered from guinea-worm disease during the year were noted. The following information was collected regarding each such person: (*i*) Name, (*ii*) Age, (*iii*) Sex, (*iv*) Caste, (*v*) Occupation, (*vi*) Pertaining to the present attack: (*a*) month in which symptoms first appeared, (*b*) situation of the worm or worms, (*c*) number of worms, (*vii*) Pertaining to the previous attack: (*a*) year in which the first attack took place, (*b*) total number of attacks so far, (*viii*) Years of residence in the village, (*ix*) Movements of the patient within last two years, (*x*) Source of drinking water.

The wells of the villages were examined systematically to find out any cyclops present in them. Where cyclops were abundant, this was an easy matter. Where they were scanty in number, straining of a large quantity of water through a thin piece of muslin and then washing the debris over the cloth into a glass dish enabled these copepods to be detected without much trouble. The condition of the wells and their nature (step-wells or draw-wells) and any sources of pollution were noted.

Disinfection of all wells infested with cyclops was carried out with lime (50 grains of slaked lime per gallon of water). The results of disinfection were noted next day. Whenever there was a chance of

revisiting the village the results were noted at frequent intervals of a week in some cases.

Geographical Situation and Physical Features of Osmanabad District

This is one of the districts in the western *Subah* (division) of Gulbarga in H. E. H. the Nizam's Dominions. It encloses the detached Barsi Taluk of Sholapur district and lies between 17° 35′ and 18° 35′ N. and 75° 16′ and 76° 40′ E., covering a total area of 4,010 square miles.

A range of hills which enters the district at the north-west corner from Ahmadnagar and continues to the south-east, divides the district into two portions, a plateau to the north-east and east and lowlands to the west, south-west and south. The taluks of Kallam, Osmanabad and part of Tuljapur are situated on the plateau, while the remainder of the district is on the lowlands. The general slope of the plateau is from south-west to north-east, terminating in the valley of the Manjra river.

The most important river is the Manjra, which forms a part of the boundary between Bhir and Osmanabad districts and later runs entirely within Osmanabad district for 58 miles before entering Bidar district. The other rivers, all of which run in a south-easterly direction, are the Thairna, the Bori and the Sina, the last forming a part of the boundary between Osmanabad and Sholapur districts.

With the exception of the hilly area mentioned above, the soil of the whole of the district consists of *regur*, a rich black loam soil, commonly known as black cotton soil. There is no forest in the district and the few trees found are generally either Babul (Acacia arabica) or of Nim (Margosa).

Climatic Conditions

The average rainfall of the district is about 27 inches. There is generally more rainfall in Tuljapur and Osmanabad taluks than in others. Parenda taluk has generally less rainfall and is notorious for having conditions bordering on famine every second or third year. In part of Tuljapur and Latur taluks the climate is hot and dry. In the rest of Tuljapur and Osmanabad taluks it is cool and damp. In Kallam and Parenda taluks it is damp. (Generally speaking the climate of the plateau is more pleasant than that of the plains.)

Population

The total population* of the district is 6,91,068. The population in each of the taluks and the sex distribution of the same are given in Table I below.

Table I—Showing Sex Distribution and Density of Population by Taluks in Osmanabad District

Taluks	*Population*		*Total*	*Density of population per acre*
	Males	*Females*		
Tuljapur ..	66,352	62,012	1,28,364	214
Parenda ..	48,138	47,024	95,162	130
Kallam ..	58,174	54,358	1,12,532	186
Latur ..	61,911	56,536	1,18,447	348
Osmanabad	50,905	47,795	98,700	209
Jagirs ..	72,009	65,854	1,37,863	178
Total ..	3,57,489	3,33,579	6,91,068	196

The total number of villages in this district is 820, of which more than 75 per cent are such as contain a population of less than 1,000.

Table II—Showing Groups of Villages of Different Sizes in Osmanabad District and the Total Population in Each of These Groups

Group	*No. of villages in the group*
Population under 500 in each village	344
Population between 500 & 1,000 in each village ..	276
Population between 1,000 & 2,000 in each village ..	152
Population between 2,000 & 5,000 in each village ..	42
Population between 5,000 & 10,000 in each town ..	4
Population between 10,000 & 20,000 in each town ..	1
Population between 20,000 & 50,000 in each town ..	1
Total ..	820

Condition of Drinking Water Supplies

1. Two towns in the district, Latur and Osmanabad, possess up-to-date plants for water supply. In the former town, water is both filtered and chlorinated while in the latter place only chlorination is carried out.

2. Rivers and rivulets.

3. Draw-wells fairly protected and of good design—This condition was found in only few villages at the time of survey. Since then, however, the Well

* Population is that of 1941 census.

Sinking Department has undertaken the task of providing each and every village in two out of five taluks (Tuljapur and Parenda) with wells of standard design and perennial supply (*vide* Fig. 1).

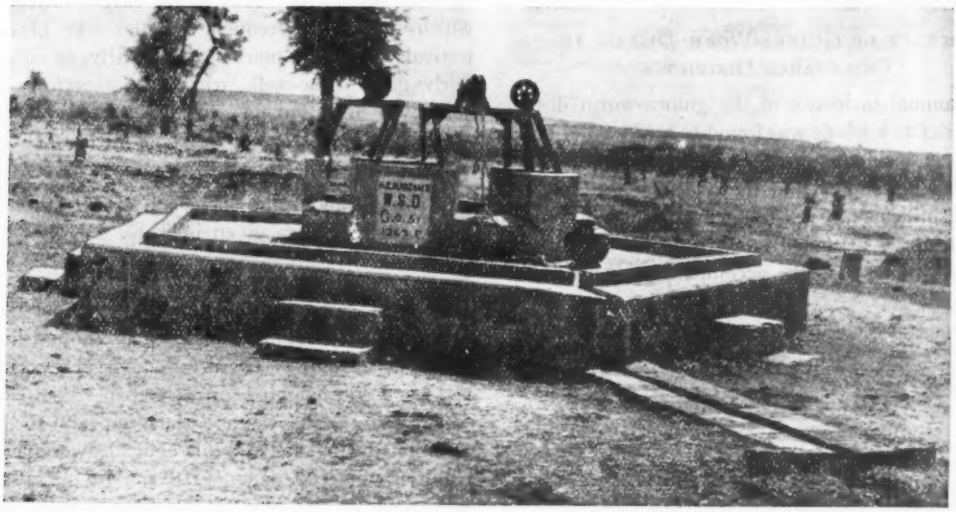

FIG. 1—A DRAW-WELL OF STANDARD DESIGN

FIG. 2—AN UNPROTECTED DRAW-WELL

FIG. 3—BATHING BY THE SIDE OF A DRAW-WELL

FIG. 4—AN OLD STEP-WELL—THE SOURCE OF INFECTION FOR A LARGE TOWN

4. Unprotected draw-wells—Some of the villages have draw-wells. These when situated inside private compounds are somewhat better, but when they are by the side of public roads and lanes, they are worse than step-wells. Very often they are on a level with the surrounding land and all the surface water and not infrequently the water from the neighbouring house-drains find their way into these wells (Fig. 2). It it not an uncommon sight to see people bathing by the side of such wells. (Fig. 3).

5. Step-wells—Where there are no rivers or rivulets, step-wells are the rule in this district, draw-wells being found in the villages at the foot of the hills or in the low lands where the level of the subsoil water is

high. Some of these step-wells are historic and even of archæological interest, *e.g.*, the wells at Tuljapur and Latur (*vide* Fig. 4).

Incidence of Guinea-Worm Disease in Osmanabad District

The annual incidence of the guinea-worm disease in the district as a whole was found to be 28·9 per mille. The highest incidence was found to be in Parenda taluk (42·3 per mille) and the lowest in Latur taluk (11·8 per mille). In the following list all the taluks of the district are arranged in the order of the severity of infection. (see also the accompanying map).

1. Parenda .. .. .. 42·3 per mille
2. Tuljapur .. .. .. 39·5 per mille
3. Osmanabad .. .. 17·9 per mille
4. Kallam .. .. .. 12·4 per mille
5. Latur .. .. .. 11·8 per mille

A Map of the Osmanabad District Showing the Incidence of Guinea-Worm Disease in Different Taluks

In some of the villages surveyed, the incidence of the disease was much higher than the average incidence for the taluk concerned. The following is the list of the villages surveyed where the incidence was more than 100 per mille.

Table III—Showing Villages with Incidence of Guinea-Worm Disease more than 100 per mille

Village	*Taluk*	*Population*	*Incidence per mille*
Asu	Parenda	700	155·7
Badgaon	Osmanabad	662	149·5
Tuljapur (Khurd)	Tuljapur	527	117·6
Bijanwadi	Tuljapur	570	117·5
Shelgaon	Parenda	501	111·7
Kolpa	Latur	382	102·1

All these are small villages with only a single step-well supplying drinking water for the entire village.

The incidence is rather low in the villages along the banks of the rivers and rivulets and having no other source of drinking water supply. In the few cases found in such places infection could always be traced to some of the step-wells in the neighbouring villages, which the people frequent for the sake of fairs and festivals or weekly markets. Similarly, in villages with fairly good draw-wells without any cyclops in them, source of infection in all guinea-worm cases found could be easily traced to some of the surrounding villages where the infection was more or less endemic.

Details about the incidence of the disease in all taluks surveyed are given in Table IV.

Age Incidence

No cases were found in children under the age of one year. The highest incidence was found in persons in the age group 11 to 20. Persons between the ages of 11 and 30 accounted for more than 50 per cent of the total cases. The disease thus appears to be more common during active adult age. Lower incidence in children up to the age of 10 cannot be satisfactorily accounted for by any of the facts known about the disease at present. Charts A and B show that the

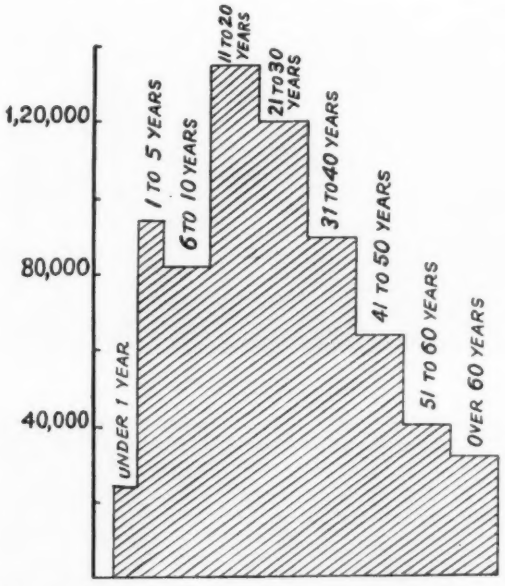

Chart A—Showing Age Distribution of the Population of Osmanabad District as per 1931 Census

variation in the incidence of the disease in the later age groups is only apparent and not real. It only follows the general age distribution of the population in Osmanabad district.

TABLE IV—SHOWING INCIDENCE OF GUINEA-WORM DISEASE IN THE VILLAGES SURVEYED IN OSMANABAD DISTRICT

Taluk	Males			Females			Total		
	Population	*Guinea-worm patients*	*Incidence per mille*	*Population*	*Guinea-worm patients*	*Incidence per mille*	*Population*	*Guinea-worm patients*	*Incidence per mille*
Tuljapur ..	15,371	731	47·6	14,176	435	30·7	29,547	1,166	39·5
Parenda ..	8,575	500	58·4	8,489	222	27·3	17,064	722	42·3
Kallam ..	13,766	273	17·2	12,755	91	7·1	26,521	328	12·4
Latur ..	19,421	265	13·6	16,840	164	9·7	36,261	429	11·8
Osmanabad ..	13,951	323	23·2	13,013	161	12·4	26,964	494	17·9
TOTAL ..	71,084	2,056	28·9	65,273	1,073	16·4	1,36,357	3,129	22·9

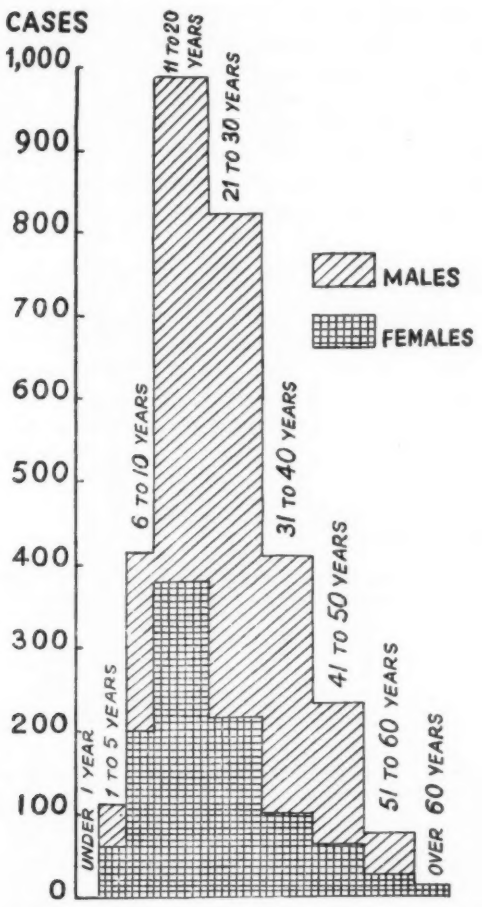

CHART B—SHOWING AGE INCIDENCE OF GUINEA-WORM DISEASE IN OSMANABAD DT. TOTAL CASES INVESTIGATED 3,129.

SEX INCIDENCE

Out of a total of 3,129 cases investigated, 2,056 were males and 1,073 females, an incidence per mille of 28·4 and 16·9 respectively. This disparity is greater in villages where the infection is imported from the other villages than in the villages where the infection is indigenous. Men run a greater risk of exposure to infection on account of their going from village to village on business or for pleasure. But this disparity being still present, though to a lesser extent, in villages with endemic infection one can only conclude that women are a little less liable to this disease than men. Once they have the disease both sexes suffer equally.

TABLE V—SHOWING THE INCIDENCE OF THE DISEASE PER MILLE AMONG MALES AND FEMALES IN VILLAGES WHERE THE INFECTION IS INDIGENOUS AS COMPARED TO THOSE WHERE INFECTION IS CHIEFLY IMPORTED

Village	*Infection indigenous or imported*	*Incidence of guinea-worm disease per mille.* *Men*	*Women*
Tuljapur ..	Indigenous	102	73
Bijanwadi ..	do	108	128
Asu	do	187	121
Shelgaon ..	do	170	100
Kolpa	do	125	77
Latur	do	8	5
Badgaon ..	do	154	145
Tammalwadi ..	Imported	15	2
Khasapuri ..	do	46	—
Ida	do	34	6
Wasi	do	19	5
Kallam ..	do	8	2
Murud Akola ..	do	14	4
Ratnapur ..	do	21	2

One attack of the disease does not appear to produce any immunity from subsequent attacks. In fact, the person apparently becomes more susceptible to the disease than the one who never suffered from it. Out of a total of 3,129 cases investigated, in 2,090 or nearly 67 per cent of cases, there was more than one attack of the disease. In 388 cases there were more than 10 attacks in the same individual in as many or more years. The highest number of attacks suffered by any individual, recorded during the present investigation was 50.

Out of 3,129 cases investigated, in 2,086 instances there was only a single worm; in 650 cases two worms; in 193 cases 3 worms; in 85 cases four worms; and in

115 cases there were more than four worms in each case. Cases were not found wanting in which as many as 15 to 20 worms were found in a single case, in different situations. (Details in Table VII.)

Location of the Worm in the Body

In a large majority of cases these nematodes were found in the lower extremity of the patients and in them again a large number round about the ankle joints. The next most favourite situation was the leg, while in not a few cases the feet were also found to be involved. In cases where multiple worms were found, the thigh was also found to be affected, while it was rare to see the worm emerge in this situation in cases with a single worm. The knee-joint was the place most dreaded by the patient for the worm to appear. In this situation, it is difficult for the worm to be extracted and the slightest sepsis means an ankylosed knee—a great handicap for a person who has to earn his livelihood by hard manual labour. In the upper extremity the forearm and the wrist were the common situations affected. In the trunk the majority of the worms appeared on the abdomen while a few made their presence known on the back and the chest. In a small number of cases guinea-worms were found in the external genitalia both in males and females. Table VIII gives the details of the results of investigation in this respect.

The total number of wells examined was 434. Of these 145 were step-wells and the rest draw-wells. Cyclops were found in 158 wells (mostly step-wells). The total number of wells disinfected was 183. 25 of these were such that, though no cyclops were found in them at the time of the examination, cases of guinea-worm disease were seen in their neighbourhood without any other obvious source of infection.

Table VI—Showing Number of Previous Attacks in Cases of Guinea-Worm Disease Investigated in Different Taluks in Osmanabad District

Taluk	*Cases without any previous attack*	*Cases with one previous attack*	*Cases with two previous attacks*	*Cases with 3-10 previous attacks*	*Cases with more than 10 attacks*
Tuljapur ..	266	174	119	421	186
Parenda ..	194	108	73	226	121
Kallam ..	113	49	33	88	45
Latur ..	237	89	42	55	6
Osmanabad ..	229	84	45	96	30
Total ..	1,039	504	312	886	388

Table VII—Showing Number of Worms in Individual Guinea-Worm Cases Investigated in Different Taluks in Osmanabad District

Taluk	*Cases with 1 worm*	*Cases with 2 worms*	*Cases with 3 worms*	*Cases with 4 worms*	*Cases with more than 4 worms*	*Total no. of cases investigated*
Tuljapur	736	240	91	50	49	1,166
Parenda	460	173	41	15	33	722
Kallam	249	58	12	5	4	328
Latur	294	89	25	9	12	429
Osmanabad	347	90	24	6	17	484
Total	2,086	650	193	85	115	3,129

Table VIII—Showing the Situation of the Guinea-Worm in Cases Examined during the Survey in Different Taluks of Osmanabad District

		Upper Extremity					*Lower Extremity*						*Trunk*					
Taluk	*No. of villages visited*	*Axilla & Shoulder*	*Arm*	*Elbow*	*Forearm*	*Hand & Wrist*	*Hips & Groin*	*Thigh*	*Knee*	*Leg*	*Ankle*	*Foot*	*Abdomen*	*Chest*	*Back*	*Genitals*	*Other sites*	*Total*
Tuljapur ..	23	—	6	—	32	35	27	150	138	454	536	276	15	9	1	13	3	1,695
Parenda ..	23	—	2	1	42	22	7	105	123	254	456	124	10	3	2	5	2	1,158
Kallam ..	23	—	—	1	8	6	3	41	25	120	185	35	2	—	—	2	—	428
Latur ..	9	—	1	—	5	19	20	57	53	128	229	117	8	—	1	13	1	652
Osmanabad ..	13	2	—	—	5	10	9	59	50	135	321	109	5	1	1	5	1	713
Total ..	82	2	9	2	92	92	66	412	389	1,091	1,727	661	40	13	5	38	7	4,646

Disinfestation of wells was carried out according to the standing instructions of the Public Health Department by treating them with lime at the rate of 50 grains per gallon of water in the well. Lime was either not available at all or it was of a poor quality in all the taluks except Latur. Consequently, for Osmanabad and Tuljapur taluks it was purchased from Sholapur and for Kallam and Parenda taluks from Barsi town.

Out of 183 wells disinfected, in six of them results were noted 24 hours, one week and one month after disinfection. In 24 wells results could only be noted once after 24 hours and for the second time after a week. In 99 wells the results were available for 24 hours only. The remaining wells (54 in number) were only disinfected with the required quantity of lime; there was no chance of examining them as the camp had to be shifted from the neighbourhood on the same day.

In all these wells examined, cyclops were scarce after six hours and disappeared entirely after 24 hours. Cyclops reappeared after one week in one of the 24 wells examined. In six wells examined after one month, cyclops had reappeared in the same numbers as before disinfestation. In only one of these there was no trace of cyclops, but this step-well concerned was a small one and at the time of the last examination was overflowing into a neighbouring rivulet owing to heavy rains.

TABLE IX—SHOWING THE NUMBER OF WELLS DISINFECTED AND EXAMINED FOR CYCLOPS IN DIFFERENT TALUKS IN OSMANABAD DISTRICT

Taluk	*Wells Examined*			*Wells found to contain cyclops & disinfected.*	*Wells not found to contain cyclops but still suspicious & hence disinfected.*
	Step-wells	Draw-wells	Total		
Tuljapur ..	59	60	119	50	8
Parenda ..	31	38	69	43	13
Kallam ..	19	95	114	27	3
Latur ..	14	37	51	15	1
Osmanabad ..	22	59	81	23	—
TOTAL ..	145	289	434	158	25

EXPERIMENTAL WORK

Owing to the unsatisfactory condition of the results obtained from the disinfection of wells with lime (as cyclops invariably reappeared after a variable interval), and the varying qualities of lime obtained in the local markets, a small series of experiments was carried out at the Civil Hospital, Latur, by the author, with the local well water which abounded in cyclops and with three different varieties of lime available in the local markets. Details of the experiments are given in Table X.

TABLE X—SHOWING RESULTS OF EXPERIMENTS CARRIED OUT AT LATUR TO FIND OUT THE BEST VARIETY OF LIME AVAILABLE LOCALLY FOR DISINFECTING WELLS FOR CYCLOPS

Date	*Well water used*	*Quantity of water*	*Approximate No. of cyclops present*	*Quality of lime used**	*Strength of lime in water*	*Results*				*Remarks*
						After 3 hrs.	After 6 hrs.	After 12 hrs.	After 24 hrs.	
10-7-37	Papnas well	3,000 c.c.	500	1	1: 2,300	Few live cyclops	No live cyclops	No live cyclops	No live cyclops	Water clarified within 6 hours.
do	do	do	500	2	do	Cyclops alive	Cyclops alive	do	do	Water still white after 24 hours.
do	do	do	500	3	do	do	do	Cyclops alive	Cyclops alive	do do
do	do	do	500	—	—	do	do	do	do	*Control*
11-7-37	do	do	500	1	do	Few live cyclops	No live cyclops	No live cyclops	No live cyclops	Water clarified within 6 hours.
do	do	do	500	2	do	Cyclops alive	Cyclops alive	do	do	Water still white after 24 hours.
do	do	do	500	3	do	do	do	Cyclops alive	Cyclops alive	do do
do	do	do	500	—	—	do	do	do	do	*Control*
12-7-37	do	do	500	1	1: 4,600	Few live cyclops	No live cyclops	No live cyclops	No live cyclops	
do	do	do	500	2	do	do	Few live cyclops	do	do	
do	do	do	500	—	—	Live cyclops	Live cyclops	Cyclops alive	Cyclops alive	*Control*

1=Surti Lime. 2=Lime prepared from Shabad stones. 3=Lime prepared from country stones.

The three different varieties of lime in these experiments were:

1. *Surti lime* (*quick-lime*)—This is probably prepared from shells; is imported from outside and comes packed in tins suitable for storing and transportation.

2. *Lime prepared from Shabad stones*—This is available locally in several places. Both slaked and unslaked forms can be had. Unslaked form is difficult to carry from place to place, particularly during rainy season.

3. *Lime prepared from country stones and pebbles*—Available in small quantities in several places in the district.

As far as the present experiments are concerned the last variety (lime made from country stones) had proved comparatively useless. The first variety (Surti lime) is the best. Lime from Shabad stones is fairly good and throughout this survey this variety was used for the disinfection of almost all the wells.

Conclusions and Suggestions

Osmanabad district is heavily infected with guinea-worm disease, Tuljapur and Parenda taluks leading in this respect. Ten per cent of the population in several places of the district suffer from this disease each year while more than 80 per cent have suffered from it at one time or the other. The average duration of the illness is about a month in uncomplicated cases, while in cases which have become septic, the duration may be prolonged to several months, ultimately causing some permanent deformity generally of the lower extremities. Adult males appear to be more prone to this disease, though no age (except for children under one year) or sex is exempt. The disease generally starts in the month of October, reaches its maximum in the month of March and by the end of July it is difficult to see a fresh case, though chronic patients may be seen throughout the year in villages where the infection is endemic. As a result, the rural population employed chiefly in agriculture suffers great loss. The chief male members and, not infrequently, the adult female members of a family become disabled at a time of the year when their labour is badly needed in the fields. Labour becomes costly and inefficient.

The endemicity of the infection is due to the fact that all step-wells and not a few of the so-called draw-wells are infested with cyclops. Places of fairs and festivals like Tuljapur etc., being heavily infected with guinea-worm, serve as nodal points for the further spread of the disease throughout the district as well as far beyond its boundaries. Persons getting infection from these places, in turn infect the hitherto uninfected cyclops in their own village step-wells. Thus a vicious circle is established and the infection becomes endemic. There is every reason to believe that the centre of guinea-worm infection is Tuljapur, which attracts pilgrims from Marathi-speaking districts both in H. E. H. the Nizam's Dominions as well as in the British districts in the neighbourhood.

The methods that can be recommended for getting rid of guinea-worm disease from Osmanabad district can be enumerated as follows:

1. Some permanent water supply scheme for all places whose population is above 5,000. In these schemes care should be taken to see that the water is available at reasonable cost to each and every individual and not to a limited few at a very high rate of taxation. This will not only protect these places from guinea-worm disease, but also from other water-borne epidemic diseases, like cholera. Places of pilgrimage like Tuljapur, which serve as nodal points for spread of the disease ought to be first attended to. A scheme for water-supply is said to have been sanctioned for Osmanabad town and a similar one for Tuljapur is still under consideration of the Government. It would have been probably better if Tuljapur scheme were taken in hand first as in all guinea-worm cases investigated at Osmanabad, the source of infection in the majority of them was traced to Tuljapur or its surrounding villages.

2. In smaller villages where step-wells are the main source of drinking water, these should be changed into draw-wells. Where either the situation or the nature of the construction of the step-well prevents this from being done, new draw-wells ought to be constructed according to the standard design prepared by the Medical and Public Health Department. It is not only the construction of these draw-wells that is important, but it is also equally necessary to educate the public to use these wells in preference to step-wells. Local village officials (patels and patwaries) should be made responsible for the proper maintenance of these wells and for reporting to Tehsil immediately, if any repairs are needed.

Till these permanent measures are adopted (which are likely to take some appreciable time) the only other

methods available are (1) biological control by breeding such fish in the wells that will devour cyclops and (2) periodical disinfection of wells with good lime.

As many of these step-wells in this district get dried up during summer months, breeding of a suitable variety of fish becomes difficult. The second method of disinfecting wells with lime, if periodically and regularly carried out, is likely to reduce the incidence of this disease a great deal. Assistant Health Officers, Health Inspectors and Sub-Inspectors may attend to this during their tours. But to ensure that the disinfection is being carried out at regular intervals, Patels in the village ought to be trained in this simple work of disinfection. They should be asked to maintain a separate register showing all the wells in the village and the dates of their disinfection with lime.

With regard to the lime and the quantity to be used for disinfection, the difficulty is that lime of good and uniform quality is not available in most of the places in the district. This is the case even in the taluk and district head-quarters. Good lime is available at Barsi Town (for Kallam and Parenda taluks) and at Sholapur (for Tuljapur and Osmanabad taluks) and at Latur. A better variety of lime known locally as surti lime, has been found toxic to cyclops in smaller quantities than the other varieties of lime. This comes packed in tins and can be stored either in the taluk dispensaries or the Tehsil Office and issued to village officials and subordinate health staff from time to time as necessary. The method to be useful and efficient must be carried out at regular intervals of a month particularly from August to April. Fifty grains of ordinary lime per gallon of water is more than sufficient, but if surti lime is used, quantities much smaller than this will suffice.

As several factors concerning the epidemiology of this disease are still unknown, it may not be out of place to state here, that further investigations both in the laboratory and in the field carried out either at Tuljapur or Latur (both being endemic centres) might give us some more information from the point of view of prevention.

At present we do not know the full bionomics of cyclops and also details as to their different species and their relative susceptibility or otherwise to carry infection. It will be a great advantage to know the weakest point in the life history of cyclops where an attack on them is likely to be more successful. Why some people should get the disease while other members of the same family drinking the same water under the same conditions should escape, is still an enigma. In some cases few attacks of the disease seem to confer a partial immunity while in others an attack seems to render the person more vulnerable to further attacks. Work in the laboratories situated in the endemic centres and with a field staff under its control is likely to yield better and quicker results than the work carried out in the laboratories situated at a great distance from the centres of infection.

Summary

A guinea-worm disease survey of the Osmanabad district in H. E. H. the Nizam's Dominions was carried out from the middle of April to middle of July, 1937.

Incidence of guinea-worm disease for the whole district was found to be 28·9 per mille. For some of the taluks it was as much as 42·3 per mille. In some of the villages surveyed it was as high as 155 per mille.

Men were found to be slightly more susceptible than women. Young adults were attacked more than persons in other age groups. Children under the age of one year were found to be free.

In nearly 67 per cent of cases investigated persons suffered from more than one attack. The highest number of attacks recorded during the present investigation in a single individual, was fifty.

Data were collected and tabulated with regard to such factors as the number of worms in a case and the situations in the body where the worms usually emerged.

Some experimental work was carried out to find out the relative value of different varieties of lime found locally as disinfectants of wells against cyclops.

Suggestions have been made with regard to the improvement of wells (conversion of step-wells into draw-wells) as a permanent measure of prevention. Construction of draw-wells of standard design have been recommended. Treatment of wells by village officials with lime at regular monthly intervals, particularly from the months of August to April, has been suggested as a temporary measure till the adoption of permanent measures.*

* Read at the Scientific Section of the XVIII All-India Medical Conference, Hyderabad-Deccan, December, 1941.

EMERGENCY AND ROUTINE USE OF COTTON AND SILK THREADS FOR SUTURES AND LIGATURES

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In times of emergency, whether civil or military, there are distinct advantages in being able to use simple and easily obtainable equipment. The physician who has learned to use materials which are available in any bazar can be equipped for emergencies, even though his usual medical and surgical equipment are not with him. But the technique of using such common materials should be acquired before the emergency arises. As the pot of boiling tea leaves or tanning bark can furnish a good emergency treatment for burns, so the reel of cotton from the housewife's mending basket or the tailor's sewing machine gives a good suture and ligature material for emergency use.

This fact has been known for a long time to those who have been in service as ambulance surgeons or have had to do surgery in out-of-the-way places under primitive conditions. But in general their use of cotton and silk, and also linen was limited to external sutures and most urgent ligatures, because of the general fear then prevalent of leaving non-absorbable material buried in the tissues. This fear may have been based on some personal experiences of having non-absorbable sutures which delayed healing unless they were extruded. The reason for this was discovered later to be associated with the size of the thread.

Quite a number of years ago, Halsted laid the foundation for the use of non-absorbable sutures in all parts of the body, and at the same time developed several changes in surgical technique which have since been widely adopted. We might call this the "silk technique", for Halsted chose fine silk. The main features of it are: (1) extreme gentleness in the handling of tissues; (2) use of fine pointed hæmostatic forceps so that large bits of tissues are not crushed and only small bits of tissue have to be tied; (3) approximation of tissues for suture with only slight or no tension, avoiding cutting through of sutures; and (4) the use of many fine interrupted sutures in place of larger and continuous sutures, wherever possible.

The students and followers of Halsted have found this technique so valuable that many large and small hospitals all over the world are using it for the majority of their operations, both major and minor. Two results have occurred. It has been found (1) that in general there is less tissue reaction about the sutures and fewer wound infections, and (2) that the hospitals have saved a large amount of money. It is mainly because of this second consideration that we wish to recommend this technique to you at this time. When budgets have to be cut and most supplies are increasing in price, it is worthwhile to consider this factor of possible economy. While the prices of both silk and cotton have more than doubled they are still very much cheaper than catgut—especially the sealed tubes. The relative cost at present for suture material for an operation such as a hysterectomy might be expressed as follows: Catgut (including chromic) Rs. 10 to Rs. 15; silk thread from reel—As. 8; and cotton thread from reel—As. 4. This is for one operation. The possible saving in the annual budget of a hospital can easily be estimated.

It is not our purpose at this time to give a complete review of the literature on the use of silk and cotton sutures. The record of experiments on tissue reaction to the various absorbable and non-absorbable sutures and on the tensile strength of the different materials makes interesting reading, as do the many reports of clinical application of these findings in large series of surgical patients in other parts of the world. But many of us do not have access to a large number of medical journals and anyway, the most convincing argument for a new technique is usuallly the hearing or reading of a report of its successful application under conditions similar to those in which we ourselves are working. Such reports are given by Strain of Miraj Medical Centre in the *Indian Journal of Surgery,* Vol. III, No. 2 and in the *Antiseptic,* April, 1941. These articles should be read by anyone who contemplates the use of cotton thread. This present report of our own experience with silk and cotton during the last five years and a half serves merely as an additional testimony to the value of these suture materials.

It was the personal observation by one of us (J. S. C.) in 1934 and 1935 of the routine use of silk sutures and ligatures in a number of large hospitals in the United States, and the opportunity for observation of and participation in some laboratory experiments on

tissue reaction to and tensile strength of various materials that led us to shift to the routine use of silk in our hospital at Hanumakonda in March, 1936. Since that time we have used catgut only for special indications, and the number of those indications has diminished as our experience had increased and our technique improved. In September, 1941, we shifted from silk to cotton because cotton in cheaper, because we wanted to try it and become accustomed to it in case silk should not be obtainable, and because we had some very favourable reports of the use of cotton sutures in recent publications.

Our routine use of silk from March, 1934 to September, 1941 in something over 430 operations and of cotton for the last three months in about 43 operations* has not only saved the hospital several hundred rupees but has also made it possible for us to reach certain conclusions about the use of these non-absorbable sutures.

In the first place, we believe that in adapting ourselves to the use of these materials we have had to improve our surgical technique. The surgeon who is used to tying knots with no. 1 and no. 2 chromic catgut will need adaptability and considerable patience to change over to the use of the fine silk or cotton sutures and ligatures. It is wise to tie several hundred knots with the silk or cotton thread outside the operating room to adjust the hands to the fine thread. Otherwise, while he is operating the first few cases and breaking the thread so many times that his temper reaches the boiling point, the surgeon may get discouraged and blame the suture material for his difficulties. But practice makes perfect. And the gentle but firm handling of fine sutures is valuable in training the hands to a gentle handling of fine tissues. And gentle handling of tissues means less postoperative pain, more quickly-healing wounds and stronger wounds. The incidence of postoperative hernia is much less with fine silk or cotton sutures for two reasons: (1) there is less foreign materials to delay wound healing, and (2) the wounds *cannot* be approximated under great tension or the suture will break at the time of operation. Wounds forcibly approximated with large sutures will separate by the cutting of those sutures through the ischæmic tissue which is under pressure or tension.

* Since reading this paper at the XVIII All-India Medical Conference at Hyderabad-Deccan in December, 1941, the authors have used cotton sutures and ligatures in about 70 more operations and are planning to continue using cotton routinely (10.4.42).

In the second place we have found that there are fewer wounds which develop collections of serum or pus in them with the silk or cotton technique. This is especially true of breast and thyroid cases, which usually require drainage when catgut is used, but not for silk or cotton.

Thirdly, we have learnt by experience when not to use these non-absorbable sutures. In the beginning we followed the rule that silk should not be used when drainage was required, that is, in the presence of pus, urine, or contamination which might be followed by the development of pus. Later, we found that this rule could be modified in certain cases, especially, if only the smaller sizes of silk were used. In incision and drainage of abscesses where ligation of vessels is required, we have tried both silk and cotton. In some of the silk cases the wounds did not heal until all the silk had been expelled. In others, this was not the case. It is our impression that the cotton ligatures act less as foreign bodies and do not delay healing even in infected wounds. But our experience is much less as yet with cotton. We had three outstanding failures with silk. In a nephrotomy for stone, the wound did not close until all the silk sutures were extruded. This may be explained on the basis either of the presence of urine, or of infection. In a case of a large ovarian cyst with a wide attachment to the posterior parietal peritoneum following the course of the right ovarian artery we removed the appendix as well as the cyst. All the silk sutures and ligatures were expelled before the wound finally healed. The third case was a large direct hernia which we repaired with a combination of fascia lata and silk. This wound did not heal finally and completely for several months until all the silk had come out. Probably the fascia lata-silk combination was similar to the combination of catgut and silk which Halsted found to be inadvisable. Furthermore, because of the fascia lata we were able to pull together the tissues with more tension—and there must have been some ischæmia and cutting through of tissue. Halsted's rule of all-silk or no-silk seems to be a good one. However, these were the only cases in the whole silk group which were outstanding failures.

In the cotton group we have had three wounds with delayed healing. In one case apparently the sterilization of some new cotton thread was insufficient. (We usually boil new thread twice before using it). In the other two cases—women with very fat abdomens, we did not use stay sutures and some dead space was

apparently left in the fat layer between the fascia and skin sutures. However, in both these cases the deep sutures have held tight and there has been no disruption of the deep layers of the wound as might be expected with catgut and no extrusion of sutures as might be expected with silk.

Fourthly, our short experience with cotton has given us an impression that cotton is preferable to silk in certain respects. Repeated boiling of cotton thread does not diminish its strength, whereas silk thread has to be discarded after three or four boilings. In contaminated obstetrical cases where suture of episiotomy or tear is required we had found that silk was very little better than catgut. But so far the cases of this type sutured with cotton have healed by primary union.

Finally, our routine use of silk and cotton has, we believe given us sufficient experience with these materials so that we can recommend them highly to others.

There are a few practical points about the use of cotton thread which need to be mentioned briefly. (A fuller discussion is given in the papers of Dr. Strain (*vide supra*). First is the size of thread. We use numbers 20, 30, 40, 50 and 60. Size 20 should rarely be used, but is helpful in ligation of large vessels in inaccessible places. Sizes 30 and 40 are ordinarily satisfactory for ligation of larger vessels, and size 50 for small vessels; size 40 for fascia, and sometimes for the closure of the peritoneum; size 50 for skin, intestinal sutures, and, if possible, for the closure of peritoneum; and size 60 for peritonealization of denuded areas and for certain plastic work. As experience increases we find we can use smaller sizes. For example by using abdominal incisions or methods of closure of hernia in which there can be approximation of fascia or peritoneum without tension, we have been able to use size 50 instead of 40 or 30. There is some variation in the strength of threads from different companies, so that occasionally a different number is required.

The color of thread used is usually black, for it shows up better in the wound after being wet with blood; whereas white thread takes up the blood color and is a little harder to see. However, for certain plastic operations we have used white for some sutures and black for others which aids in recognizing them for tying.

The thread, which is wrapped tightly on the original reels, should be removed and placed *loosely* on spools or reels for ligatures and on wooden paddles for

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MODIFIED MALARIA FLOCCULATION TEST

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Among the present day laboratory methods in the diagnosis of malaria, the seroflocculation tests are the simplest, involving little labour, equipment and personnel. The earliest test was introduced by Henry (1928) based on the property of the malarial serum to flocculate a solution of melanin pigment derived from the choroid of oxen eyes. The original test was intricate and laborious and did not gain much favour. Hence many modifications of the original test have been in vogue since its inception [Villaiii and Dupoux (1939), Pikoul and Osipova (1939), Proske and Watson (1939)].

The exact chemical nature of the reaction is still illunderstood. Henry (1934) thought that the reaction was probably the result of an interaction between melanin pigment acting as an antigen and a corresponding antimelanin developed in the human sera after malarial infection. Chorine and Gillier (1933) suggested that the reaction might be due to an increase

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sutures. Tight winding on wooden spools weaken the thread because of expansion of the wood during boiling. All thread is boiled once on these spools or paddles before being put with the surgical supplies. Before each operation, a number of spools of ligature thread and a little more than enough thread sutures are boiled with the instruments. A great deal of time is saved by threading all the sutures in needles before the operation. These needles and threads are wound around gauze sponges or wooden tongue depressors for sterilization.

Smaller needles can be used for cotton and silk than would be needed for catgut sutures of the usual sizes, but the needles should be strong enough not to be broken by the needle holder. We have found it necessary to tie one knot in the thread at the needle eye, to keep the thread from repeated pulling out.

We hope this report of our experience with silk and cotton sutures and ligatures may stimulate others to try these materials not only for emergency but also for routine surgical work.

in the serum globulins accompanied by loss of equilibrium in the other soluble constituents of the serum. They incidentally demonstrated that the melanin pigment had no antigenic value and the positive sera would become negative if heated to 55°C. Greig, Van Rooyen and Hendry (1934) confirming the findings of Chorine and Gillier suggested the adaptation of the term melano-precipitation instead of melano-flocculation for the test.

Wisemann (1934) while studying the nature of Henry's reaction in malaria noticed that when malarial serum was added to distilled water a precipitate occurred. He observed that the reactions with the water control was, in fact, more reliable and much simpler than the original Henry's test. This simple test for malaria gained popularity and favour in most parts of the globe instead of the complicated melano-flocculation test. Wolff (1940) described a new serological test for the diagnosis of chronic malarial infection, based on the precipitation of a protein fraction of the blood serum (euglobulin) by buffer solutions. In our hands the test has not proved by any means more sensitive than the Wiseman's distilled water test nor as simple.

The malarial flocculation test as carried out with distilled water has been in use in the Krishnarajendra Hospital, for the last eight years. This test is done routinely as an adjunct to the thin and thick smear examinations for the presence of parasites, whenever there is a history of irregular fever treated half-heartedly. The parasites are invariably absent in the peripheral blood after the administration of quinine and the test (malaria flocculation—M.F.) becomes of diagnostic value then. Patients complaining of vague pains in the muscles, physical and mental fatigue, irritability, and insomnia have completely recovered with one or two intravenous injections of atebrin or quinine when the flocculation test happened to show a positive reaction.

While carrying out the malarial flocculation test in the laboratory with distilled water, we observed that the accidental contamination of the distilled water with small quantities of ethyl-alcohol sensitised the reaction to a great extent. On this lead we tested a series of normal individuals and malarial patients with varying strengths of alcoholic solution in distilled water. When a large set of alcoholic solutions ranging from 2·0 to 50 per cent were tested, we observed that the malarial sera behaved differently from the normal sera. When normal sera exhibited positive reactions beyond 20 per cent strength, the malarial sera continued to present flocculation at lower strengths. In ranges where there was overlapping *viz.*, over 20 per cent, the flocculation was definitely denser with malarial sera. We, therefore, decided that a strength round about 15 per cent alcoholic solution would neither be too sensitive nor too indifferent for the purpose to carry out our investigation.

Technique of the Test

The blood—Two cubic centimeters of venous blood are drawn from the patient's vein with all aseptic precautions, preferably rinsing the syringe in sterile normal saline to prevent hæmolysis. The blood is placed into a clean small dry test tube and allowed to clot at room temperature. When the test is required to be done in haste, the serum is separated by centrifugalisation. The sera in all cases are required to be clear.

The test solution—The solution is prepared freshly every day by adding 1·5 c.c. of absolute alcohol to 8·5 c.c. of freshly prepared distilled water. The ethyl alcohol is obtained from the Industrial and Testing Laboratory, Bangalore. We have noticed pure ethyl alcohol of any make serves the purpose.

The actual test—Two clean test tubes roughly measuring 8 cms. in length with an internal diameter of 8 mm. are taken. One is filled with normal saline approximately three-fourths full and serves as control. The second test tube is filled to the same level with the freshly prepared alcoholic solution. Two drops of the clear serum to be tested are added by means of a clear glass pipette to each of the tubes. The two tubes are inverted twice or thrice to allow thorough mixing of the sera. In most of the cases the opalescence appears immediately as the serum diffuses through. It is wise however, in doubtful cases to read the results after half an hour kept at room temperature.

The reading is best done by daylight. The two tubes are held side by side against a partly shaded window. Instance of even the lightest turbidity shows up distinctly as a contrast, against the clear control tube. The readings are marked as "Plus-minus" "One Plus", "Two Plus" and "Three Plus" according to the degree of opalescence.

Experimental data—A comparative study of the flocculation test (M.F.) was made on three hundred in-patients of the Krishnarajendra Hospital. Of these, two hundred and seven had a history of recent malaria,

Forty of them had malarial parasites in their blood at the time of conducting these tests. All the sera were tested with distilled water, Wolff's buffer solution and 15 per cent alcohol, under identical conditions and the results are shown in Table I.

TABLE I

Solutions	*Number Positive*	*Percentage*
Distilled Water ..	122	59·0
Buffer Solution (Wolff)	105	50·7
Alcoholic Solution ..	175	84·4

Number of cases tested—207

One hundred and sixty individuals in the above series had enlarged spleens and it was found that there was a higher incidence of positive reactions among them. As a control group, a series of ninety-three in-patients admitted for various surgical conditions were examined similarly, who denied history of malaria within the past one year. All of them were examined for evidence of enlarged spleen. Their bloods were also examined for parasites. The results of the tests in this group are shown in Table II.

TABLE—II

Solutions	*Number Positive*	*Percentage*
Distilled Water ..	14	14·8
Buffer Solution (Wolff)	3	3·2
Alcoholic Solution ..	20	21·0

Number of cases tested—93

We have not shown here a comparative statement of the intensity of positive reaction. In all the positive findings we noticed, the opalescence was greatest with the alcoholic solution, the buffer and distilled water being both of equal intensity.

A comprehensive table (Table III) helps in the evaluation of the sensitiveness of these tests.

TABLE III

	Percentage positive with		
	Distilled water	*Buffer Solution*	*Alcoholic Solution*
1. History of malaria with or without enlarged spleen ..	59·0	50·7	84·4
2. History of malaria with parasites in blood ..	62·5	53·0	85·0
3. No malarial history ..	14·8	3·2	21·0

DISCUSSION

As long as the test is not serologically specific like an antigen-antibody reaction, it is bound to have certain limitations. In spite of the lack of specificity, experience has shown here and elsewhere that it is a valuable adjunct in the diagnosis of malaria, Suspected cases of malaria with no typical history, coming often from endemic areas complaining of vague symptoms like neuritis, myositis and general debility often show a positive flocculation. Their blood smear examinations invariably show absence of parasites both in thick and thin smears, and antimalarial treatment given on the grounds of the positive M.F. test has given them complete relief in the course of a week.

The reaction is negative in the early part of the disease and becomes positive with the administration of antimalarial therapy, from a week to ten days later. We find no serological relationship existing between the malarial flocculation and Widal, Kline's or Kahn's test for syphilis, though the Wassermann test may be occasionally weakly positive in chronic malaria. The M.F. test is also not directly dependent on total red cell count and hæmoglobin percentage though a large number of the patients show severe or moderate anæmia.

Kala-Azar is supposed to give a positive reaction but our experience in this direction is limited due to the scarcity of the disease in these parts. Patients with carcinoma of one or the other organ have shown a positive reaction.

The value of a negative flocculation is quite high, provided the result is confirmed by a subsequent test ten days later.

SUMMARY

1. We have described a new test for the diagnosis of chronic malaria using 15 per cent solution of alcohol in freshly prepared distilled water.

2. The test is very sensitive. The results being read immediately or after half to one hour at room temperature.

3. This test is suitable for routine work even on a large scale and is an important adjunct in addition to thick and thin blood smear examinations.

Dr. J. F. Robinson, Medical Officer, Krishnarajendra Hospital, Mysore, introduced the malaria flocculation test in this hospital nearly eight years ago. Ever since its introduction it has been carried out as a routine test and as a very valuable aid in diagnosis.*

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THE ROLE OF VENOM THERAPY IN CHRONIC PAINFUL CONDITIONS

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The problem of pain has challenged the thought of scientists and philosophers for ages all over the world. The victory over pain has not so far been complete since pain is not a disease but a symptom complex. It is essentially an exaggerated sensation caused in the organism as a protective warning. It warns the individual that some abnormal or pathological process is playing a part in a certain part of the body and is deleterious and not natural for the physiological functions of the organism. In pain, both the physiological and psychological processes play a prominent role. Each of these factors vary with the temperament, the intellectual range of perception and the susceptibility of the individual. In some persons the pain sensation may vary during different periods and circumstances. There is, therefore, no absolute criterion subjective, or objective, by which we can determine or measure the pain sensation accurately. The pain may be organic in type or it may be functional, in other words, hysterical or psychogenic. In the latter types there is no physical cause discernible and the affected part of the body is not related to sensory nerve distribution and is not amenable to analgesic drugs.

Whatever the causative factor of pain may be, it is important to remember that the patient demands a quick and as early relief of pain as possible. Though the investigation of the causal factor of the pathogenesis of pain is important but clinically early bringing out of relief is much more urgent than the diagnostic investigations. With the advancement of synthetic chemistry and the discovery of various analgesic drugs, particularly the coal tar derivatives, we have got at present a host of very efficient analgesics and hypnotics at our disposal. These drugs act in different ways: amidopyrine and the barbiturates increase the threshold of pain, opiates act mainly on the pain centres in the brain, belladonna relaxes the muscle spasm by acting through the parasympathetic nerve endings while ergotamine acts mainly through sympathetic mechanism. All these are potent drugs and act spectacularly as analgesics, hypnotics and anæsthetics in acute conditions, but their action though rapid in onset is temporary in nature. In certain conditions where pain is chronic and very exhausting in nature as in nerve leprosy, inoperable malignant tumours, tic douloureux, tabetic crises and migraine etc., one has to search for analgesics which should have more lasting action and should not produce deteriorating or habit-forming effects on the individual when used for a long time.

We are going to discuss below the action and uses of cobra venom which has been shown to have a selective action on higher level of the nervous system and fulfils all the above conditions as an ideal analgesic.

The use of snake venom is familiar to the Indian physician for centuries as a healer of various complaints as ascites, skin diseases, liver complaints, cholera, leprosy, rheumatic pains and impotency. It is known as *sarpavisha* in Hindi and *sarpagarala* in Sanskrit. In the homœopathic system of medicine also the venom is known as an important therapeutic agent for over thirty years. In 1929, Adolph Monelesser of New York was informed of a leper who was relieved of a severe pain after being bitten by a tropical spider. This led Monelesser to suggest to Calmette of the Pasteur Institute, Paris, that the use of animal poison might be of value for the relief of severe and intractable pain. Out of all the venoms, this French physician selected the venom of the cobra for his trial since it is very rich in neurotoxin. Monelesser and Taguet (1933) of the Pasteur Institute, Paris, reported their results on cobra venom therapy in various painful conditions, particularly cases of terminal cancer.

French workers in Europe, Macht and his associates in America, Kellaway and his colleagues in Australia and Chopra and Chowhan and others in India by their research work on snake venoms have established for cobra venom therapy a prominent place in pharmaco-therapeutics as an analgesic. In 1929, the author started a systematic study on the pharmacology of the venoms of Indian poisonous snakes under the guidance of Lt.-Col. Sir R. N. Chopra, I.M.S. in the School of Tropical Medicine, Calcutta. Due to interesting pharmacological findings in mammalia, Chopra and Chowhan (1933) started clinical trials in the hospital attached to the above institute at Calcutta. A review on the systematic action of venoms on different tissues was published by the above authors in 1935 and on the pharmacology and therapeutic applications of cobra venom in 1937. They reported their interesting results on the treatment of nerve leprosy in 1938 and on

the uses of venoms in other painful conditions in 1940. Table I shows the active principles on which the therapeutic value of snake venoms is based.

Active Principles of Snake Venoms

The application of snake venom in medicine is based on the presence of the following active principles: (*a*) neurotoxin, (*b*) cytolysin, with the property of absorbing of the granulation tissue, (*c*) coagulation and hæmorrhagic enzymes producing protein and histamine like shock and, finally, (*d*) properties to protect against rabies and epilepsy etc.

Table I—Showing the Action of Active Principles of Snake Venoms (After Chopra & Chowhan, 1935)

Active principles	*Venoms*	*Action and uses.*
Neurotoxin	Cobra.	Depresses medullary and psychical centres, paralyses nerve end plates, stimulates cholinestrase. Used in delirium, hysteria, epilepsy, pain of cancer, nerve leprosy, hyperpiesis and tabetic crisis.
Hæmorrhagin	Viper, Crotalus.	Produces intravascular clotting and fall of blood pressure.
Agglutinins	Cobra, Viper.	Used in hæmophilia, purpura, epistaxis, menorrhagia and hyperpiesis.
Anticonvulsant, Protein desensitiser.	Cobra, Viper, Crotalus.	Used in epilepsy, chorea, asthma, erysipelas and allergies.

Neurotoxin—The neurotoxin is one of the important active enzyme and is present in all the venoms though it is markedly preponderant in the cobra venom. This principle has a strong depressant action on the higher centres. Its action is particularly marked on the vasomotor and the respiratory centres and some workers are of opinion that the seat of its action is in the optic thalamus. After prolonged large doses it produces a paralysis of both the sensory and motor end-organs. This happens in the case of snake bites where the main action is local due to the direct contact of venoms with tissues. The venom, therefore, in graduated small doses may be used to depress the higher psychical centres and is useful in delirum, hallucination, aphasia and melancholia. Improvement may occur in apoplexy, meningitis, hysteria and chorea. It may be used to depress the respiratory spasms of the asthmatic attacks. In small doses it may be useful in early stages of hemiplegia and paraplegia. On account of its producing anæsthesia by paralysing the sensory nerve-endings it has been used locally to stop the severe pain of inoperable malignant tumours.

Cytolysin and tissue absorption enzymes—The venom produces necrosis by damaging the intima of the blood vessels when it is injected intravenously. Cobra venom has the property of absorbing granulation tissue and the neoplastic and granulation tissue cells formed in the tissues. This property has been utilized in the treatment of malignant growth with the idea of absorbing the neoplastic cells of the tumour. Laignel, Lavastine and Korossios (1933) have shown that in this way the growth of the neoplasm is retarded and even the distant metastases may disappear.

Hæmorrhagin, thrombase and agglutinin—Cobra venom when injected intravenously produce intravascular clotting while viper venom and crotalus venom produce excessive hæmorrhages. The hæmorrhagic and neurotoxic principles in it may be used in the treatment of epilepsy, blackwater fever and hæmophilia. Mixture of different venoms having both the coagulating and neurotoxic properties has been used in the treatment of menorrhagia, metrorrhagia, bleeding piles, epistaxis, purpura, hæmophilia and flushes in females.

Mode of Action of Cobra Venom as an Analgesic

We have stated above that the neurotoxin is responsible for the selective action of venom on the nervous system. Oh (1936) tested the action of Formoosan snake venoms on the motor and sensory nerve endings and on the pain centre. He employed Okushima method for its effect on this centre. The venom was injected subcutaneously on the back of the mice and the pain responses were tested by pricks on the tail. The authors observed that the venom of *T. gramineus* and *Naja atra* paralysed the sensory nerve endings of the frog more rapidly than the venom of *T. mucrosquamatous, Ancistrodon acutus* and *Bungarus multicinctus.*

In the case of paralysis of the motor nerve endings, *Naja atra* had the most rapid action compared with other venoms. The pain centre in mice is markedly depressed with 0·0001 mg. and obviously with 0·00005 mg. of venom of *Naja atra* per gramme weight of mouse and markedly with 0·003 mg., and distinctly with 0·0005 mg. of *B. multicinctus* venom per gramme body-weight of mouse. Kellaway (1934) reported that all the Australian snake venoms along with the Indian cobra have a paralysant action *in vitro* on the sensory nerve endings in frogs (*Hyla aurea*) though this action was less powerful than on the motor nerve endings.

TABLE II—SHOWING CENTRAL ANALGESIC ACTION OF SNAKE VENOM (IN MOUSE)

Venom	*Dose per gm. of body weight*	*Action*
Naja atra	0·0001 mg.	Markedly depressed
	0·00005 mg.	Obviously depressed
B. Multicinctus	0·003 mg.	Markedly depressed
	0·0005 mg.	Distinctly depressed

Cicardo (1935) reported that cobra venom increases the rheobase and chronaxie of the motor nerves before curarization. Muscle chronaxie may also be increased. The changes in sensory nerves may take place before those in the peripheral motor nerves. Macht (1938) demonstrated the analgesic effect of cobra venom in man and guinea-pigs. After subcutaneous and intramuscular injections, the susceptibility to pain caused by an electric current was greatly diminished and lasted for several hours. This author further revised his various observations on the action of cobra venom on the nervous system. He believes that the numbing action and paralysis of a human being bitten by a cobra was due to its local anæsthetic effect caused by the protoplasmic poisoning action of the overwhelming amount of the venom concentrated at the place of the bite. When the venom injected is of very low concentration or when it is injected in therapeutic doses, the cobra venom affects neither the sensory nor the motor nerve endings nor the ascending nor descending fibres of the peripheral nervous system. The analgesia produced in therapeutic doses is (1) central in origin and closely resembles that produced by morphine. In experiments on normal human beings injections of cobra venom either markedly increased the resistance of pain or heightened sensory threshold. In experiments on mice, rats and guinea-pigs it was found that cobra venom injections antagonized the action of certain convulsant drugs such as camphor, metrazol (cardiazol) and picrotoxin. Macht (1938) further demonstrated that the effects of cobra venom, unlike opium alkaloids differed in the fourth dimension of pharmacodynamics *i.e.*, the time element involved in all its pharmacologic actions. Morphine exerts the analgesic and hypnotic action in a very short time (within 10 to 20 minutes). This effect persists only for a few hours and then disappears rapidly, probably due to the rapid destruction of opium alkaloids in the brain tissues. On the other hand, the venoms produce their effect slowly, after several injections and once induced, the analgesic effect persists for several weeks. (2) The action of cobra venom may be said to be similar to that of digitalis. During the treatment it undergoes a period of saturation for three to four days. After this a stage is reached when the dose necessary for the amount and the character of pain is maintained. (3) Cicardo (1935) suggested that cobra venom probabaly increased the pain threshold of the peripheral nerve mechanism. (4) Chowhan and Chopra (1938) while studying the action of cobra venom in nerve leprosy stated that this analgesic action of cobra venom may be due to its supplementing the choline-esterase enzyme. The latter enzyme counteracts acetylcholine, the biochemical transmitter of nerve impulses. There are indications showing that cobra venom does not only supplement choline-esterase but may be acting as this enzyme itself. It is too early but it is possible to consider cobra venom as a choline-esterase substitute of the future. It is probable that this counteraction of cobra venom against acetyl choline increases the pain threshold. Clinically, vitamin B_1 has been seen to synergise the action of cobra venom. (5) The advantages of cobra venom therapy over other analgesics is that it does not produce a tolerance nor there is evidence of habit formation in the individual. There is no craving for the drug and its dose may be increased or decreased at will without any withdrawal symptoms as compared to morphine. There is no nausea or vomiting with cobra venom treatment. Such symptoms, if present in patients are oftener due to neurosis and fear from deleterious effect of the snake venom. This action is due to increase of the gastrointestinal peristalsis as in the case of emotions or psychic conditions. (6) In therapeutic doses cobra venom possesses anticonvulsant properties and relieves painful contractures and hence it has been tried with benefit in epileptic convulsions and acute Parkinsonism. (7) Cobra venom therapy improves the psychic outlook of the patient something similar to euphoria and hence it maintains a better nutrition and courage under the regimen of venoms than under opiates or barbiturates.

MEASUREMENT OF ANALGESIA PRODUCED BY SNAKE VENOMS

It is not easy to measure quantitatively the extent of relief produced by different analgesics. In order to compare the efficiency of different analgesics, Macht and Macht (1939) devised a very simple technique for the qualitative and quantitative estimation of analgesia produced as distinguished from local anæsthesia. The authors named this as the *"Rat test"*. The scrotum of a large tame rat has been found very suitable for the

determination of the pain sensations. The skin of the scrotum is richly supplied with sensory nerves and hence responds rapidly to the Faradic current. A definite spot on the scrotum is selected and marked out for frequent application of the current. Fine platinum electrodes connected with a secondary induction coil are repeatedly applied at this spot and the current at the electrodes is increased or decreased at will by approximating or taking away for the secondary coil from the primary one. This experiment is repeated till a definite sensation of pain is demonstrated in the form of a squeal of the rat. The amount of induced current gives the control unit of the pain threshold in rats. Thus analgesic and anæsthetic drugs are injected subcutaneously or administered by a stomach tube. The pain threshold is measured again at intervals of ¼, ½, 2, and 4 hours. Various drugs like phenobarbital, cocaine, codeine, dilaudid, morphine and cobra venom etc., are thus tested.

Table III shows the relative amount of current required at different intervals to produce pain squeal in rats after injection of different drugs. The figures in centimeters show the distance of the secondary from the primary coil and the voltage of the current required to produce the squeal the pain threshold. From table III it will be seen that while morphine and cocaine are rapid in action and require a high voltage to produce the pain threshold within ¼ to ½ hours and the voltage rapidly decreases after that interval but in case of cobra venom the pain threshold was markedly increased after two hours and onwards and a very high voltage of current was required to produce the squeal in rats. The above figures clearly show that cobra venom, particularly in one to two mouse units dosage is one of the best slow acting analgesic. Once the analgesia was produced the action persisted for a long time. In the case of other analgesics the action was more fleeting in nature.

TABLE III—SHOWING THE COMPARATIVE ACTION OF COBRA VENOM AND OTHER ANALGESICS (AFTER MACHT AND MACHT, 1939).

Drugs	*Dose in mgs.*	*Normal*		*After ¼-½ hours*		*After 1-2 hours*		*After 4 hours*	
		cm.	*volt*	*cm.*	*volt*	*cm.*	*volt*	*cm.*	*volt*
Sodium salicylate ..	10	7·2	325	6·8	445	6·6	445	—	—
Sodium phenobarbital ..	5	7·4	280	—	—	7·8	218	7·7	232
Cocaine hydrochlor. ..	2	9·5	125	9·8	110	9·8	110	—	—
Antipyrine	10	7·6	250	—	—	7·2	325	7·3	300
Acetanilide	4	7·8	218	7·8	218	7·0	368	7·5	265
Dilaudid	0·25	9·0	100	7·0	368	7·0	386	—	—
Codeine hydrochlor. ..	2	9·5	125	8·2	176	9·5	125	—	—
Morphine sulph.	1	6·0	809	6·1	770	7·0	368	6·0	809
Morphine sulph.	3	3·9	205	4·9	1260	8·0	185	7·9	205
Cobra venom	0·5 m.u.	7	368	6·6	530	6·7	480	6·5	575
Cobra venom	1·0 m.u.	8	185	7·0	368	4·0	1932	5·0	1223
Cobra venom	2·0 m.u.	8	185	6·0	809	5·4	1080	6·4	630

THERAPEUTICS OF COBRA VENOM

Uses of cobra venom in nerve leprosy—It was reported by Muir (1936-37) that in India over 50 per cent of cases of leprosy are of the nerve type with symptoms of neuritis *i.e.,* formication, tingling, sensations of *"pins and needles sensations"* or that of electric shock or even shooting pain along the course of the nerves. The above sensations are particularly complained when the affected parts of the body are hit. Chowhan and Chopra (1938) reported 32 cases of nerve leprosy treated with cobra venom. The venom was injected intramuscularly or intradermally in and around the area of the nerve supply. Injections were administered once or twice weekly in doses ranging from one to twenty m.u. The relief was felt after the second or the third dose and the pain almost disappeared completely after the sixth or eighth injection. All the patients treated were outdoor cases and the criteria of improvement were the return of normal sensations and a better sleep at night and relief of uncomfortable sensations due to the lesion. Gass (1938) also reported favourably on the use of cobra venom in cases of leprosy. We obtained definite relief in from 60 to 80 per cent of the patients treated with cobra venom. There was marked relief in 43·7 per cent, some relief in 50 per cent and slight or no relief in 6·3 per cent of the cases. Though cobra venom will never be in a position to replace chaulmoogra oil and other measures used in the treatment of nerve leprosy, yet it may be safely claimed as a weapon in combating against the severe and intolerable pain of this disease. Its importance cannot be more strongly emphasised since about 75 per cent cases of leprosy in India suffer from nerve type of the disease. Badger and Patrick (1938) reported on the beneficial effect in neuritis after intramuscular injections of vitamin B_1 administered in 3,000 inter-

national units. This drug has not been very favourably reported in this country but we noticed that when it was used along with cobra venom, the relief of pain was more marked showing that these drugs act synergistically to one another.

Cobra venom in painful conditions—Over 500 patients suffering from different painful conditions have been treated by us in the Hospital and the Out Patients Department of the Calcutta School of Tropical Medicine during the last five years. The cases treated were suffering from neuritis, neuralgia, sciatica, fibromyositis, tic douloureaux, arthritis, filarial orchitis and funiculitis and paræsthesia etc. Of 65 cases reported by us (1940) there was marked relief in 35 per cent, definite in 35·4 per cent, slight relief in 13·8 per cent. In the case of definite relief the patients stated that the relief was about eight annas out of a rupee. The maximum dose of the venom used was 20 m.u. The initial relief was usually reported after the third or the fourth dose. In some cases vitamin B_1 or novalgin was added to accelerate the action of the cobra venom. In our experience intradermal injections possessed no particular advantage over the intramuscular route. We came to the conclusion that cobra venom plays a definite part in the relief of pain of indefinite nature. The action of venom was slow but the relief was of a permanent nature.

Uses of cobra venom in cancer—Calmette and others (1933), Taguet and Rousseau (1934), Vellard and Vianna (1935), Macht (1938), Chopra and Chowhan (1937) reported on the alleged beneficial effects of cobra venom in cancer. Macht reported over hundred cases of cancer of the breast, uterus, rectum, jaw, ovary, tongue and bladder, treated with marked relief of pain and other symptoms in these cases. Mitra (1938) reported that treatment of cancer with Todd's method of sulphur selinide injections along with x-ray therapy produced no relief of pain. He then gave injections of cobra venom every 72 hours and increased the dose by 5 m.u. with a marked relief of pain. We have had occasion to try cobra venom injections in a few cases suffering from inoperable cancers of the rectum, cervix of the uterus with metastases into the pelvic viscera, cancer of the lungs, liver, throat and larynx etc.. with relief of pain for many months before death of the patients.

Therapeutic Doses of Cobra Venom

The injectable cobra venom is standardised in *mouse units i.e.*, the amount of cobra venom which will kill a 20 gramme weight of white mouse in 24 hours. This mouse unit of the venom is the initial therapeutic dose for man. Chopra and Chowhan (1941) have further discussed various methods suitable for the sterilisation of venom solutions used for parenteral therapy. Cobra venom is injected intramuscularly twice or thrice weekly with an initial dose of one m.u. The dose is gradually increased upto 10 to 20 m.u. Some American workers believe that injections may be started with 5 m.u. given twice or thrice daily till a saturation point is reached and then to stick to a maintaining dose of 5 m.u. daily. We have found it safer to go on increasing the dose gradually twice or thrice weekly. In this way ill effects, as reported by other workers, are not noticed though the time of treatment is prolonged. Rapid analgesics as amidopyrine, salicylates, novalgin or opiates may be used in the initial stages to control the pain. Vitamin B_1 injections are noticed to synergise the action of cobra venom.

Conclusions

The above observations clearly show that in cobra venom therapy we are promised a very important analgesic which is relatively harmless as compared to other analgesics. It is a slow acting drug but when its action is once established its effect continues for a long time. For the above reasons it is best indicated in chronic pains as tic douloureaux, sciatica, cancer, nerve leprosy etc., conditions where the analgesics are to be continued for a long time. Its use does not produce any deleterious effect or drug habit after prolonged use.*

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FIVE YEARS OF ANTI-MALARIA WORK AT LILLOOAH RAILWAY SETTLEMENT

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Divisional Medical Officer, East Indian Railway Cawnpore

General—The Lillooah Railway Settlement, about 5 miles to the north-west of Calcutta, is situated on the waterlogged plains on the west bank of the river Hoogly. The colony is about one mile long and one-third of a mile broad.

Population—The population of the colony is about 3,600 but the statistics are based on the strength of the staff which is about 900.

Telluric Conditions—The natural soil is composed of alluvial deposit but with rapid development of industrial enterprises in the surrounding areas the superficial soil has changed into an artificial one. The number of marshy lands have increased very much due to huge discharge from mills and factories and inadequate drainage. With the rising importance of the place, land all round have been reclaimed for erecting mills, factories, and dwelling houses for a large number of immigrant population but the far off river being the only source of water supply the number of ponds (tanks) have increased so much that even the railway anti-malaria control area of half a mile radius contains more than 600 of them.

Natural drainage—Natural drainage is to the west through some extensive marshy lands which overflow into a far off canal discharging direct into the river Hoogly. There are three out-fall drains two of which flow close to the railway settlement while the third one flows at a distance of about half a mile to the south of the Railway colony. These drains flow from east to west in circuitous ways and receive discharges from a net-work of small drains along their courses and finally discharge into the marshy lands.

Rainfall and Humidity—Rainfall is on an average of 65 inches per annum; the maximum of which falls as monsoon rain during the period from August to September. Humidity on an average varies every year from 70 to 90 per cent.

Previous History of Sickness—The place all round is very malarious. Figures of previous sickness recorded at the Railway Hospital show that in 1934-35 malaria claimed 35 per cent of the total number of sick days lost due to all diseases, a figure which came down to 11 per cent in 1938-39 after 5 years of antimalaria work. Preventive measures had to be undertaken from time to time prior to the systematic antimalarial work in an effort to bring down the heavy sickness but the following table which gives the actual figures of malaria cases per mille for three years before and after the start of the present antimalaria scheme show that no measures short of a full fledged antimalarial campaign had any effect on the malaria figures and that the work on scientific lines produced remarkable results in a very short time.

Before the campaign			*Last 3 years of campaign*		
Year		Malaria cases per mille	Year		Malaria cases per mille
1931-32	..	758	1936-37	..	311
1932-33	..	682	1937-38	..	213
1933-34	..	1103	1938-39	..	151

SEASONAL VARIATIONS AND THE EFFECT OF ANTI-MALARIA WORK ON THE 'PEAK' OF THE MALARIA INFECTION

Malaria cases are recorded throughout the year at Lillooah but fresh infection generally starts after heavy rain. A graph showing the monthly incidence of malaria infection in 1934-35 (April-March) when the anti-malaria work was in its initial stages and its beneficial results were not demonstrable is given and shows a double rise of infection. The highest 'peak' is in August-September and then a gradual decline and a sharp rise again in February-March. This knowledge had a direct bearing on the period of infection in the following years. The malaria staff, I believe, took extra precautions just before and during the periods of highest infection and relapses with the result that the 'peak' in 1938-39 after 5 years of antimalaria work as shown by the graph of that year took an unnatural course and shifted to another period during which the

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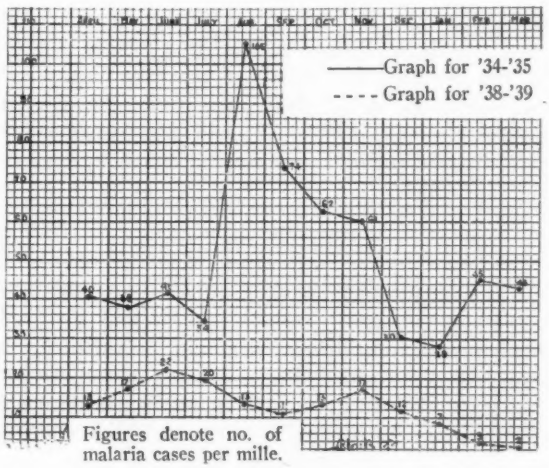
antimalaria activities were comparatively not so very vigorously followed as at the admittedly dangerous periods of August-September and the winter rise altogether disappeared. Early or late advent of monsoon also changes the 'peak' and the winter rise but not to the extent as antimalaria activities do as shown by graph of 1938-39 (*vide* Graph 1).



GRAPH 1—SHOWING THE SEASONAL VARIATIONS OF MALARIA SICKNESS AND THE EFFECT OF ANTIMALARIA WORK ON THE PEAK OF INFECTION

ORIGIN OF THE PRESENT SCHEME

In 1929 the presence of A. Ludlowii (A. Sunduicus) was located in the outskirts of the city of Calcutta by the Public Health Department of Bengal. Soon after that malaria broke out in an epidemic form in places infested with A. Ludlowii. The Public Health Department, Bengal had, therefore, to take the field vigorously and watch the spreading of range of the mosquito. In November, 1933, breeding of A. Ludlowii was disclosed in a few tanks close to the river Hooghly in Belur by the Public Health Department. One of those tanks lay very close to the railway settlement at Lillooah. A meeting was convened by the Director of Public Health, Bengal with representatives from the local railways and municipalities for their co-operation in the campaign against the Ludlowii menace. The East Indian Railway authorities who were already contemplating a scheme of their own to control the long existing malaria in their colony responded in right earnest, expert opinion was obtained, a scheme was prepared and the work was started independently in May, 1934.

Malaria Survey—A detailed survey of the area round about Lillooah Railway Settlement was made and a map was prepared showing all the necessary details. The situation disclosed by the survey was exasperating as more than 600 water collections teeming with larvæ were found within an area of half a mile radius which needed initial cleaning and subsequent maintenance. Apart from the question of cost and organisation the task of making the owners of the tanks to yield to the necessary antilarval operations was tremendous.

Splenic Index—It was taken in 1934 before starting the work and was found at the high level of 80.

Engineering project of the scheme—All low lying areas and borrowpits inside the railway settlement were filled up and drains were reconstructed.

Cleaning and maintaining the water collections—In the beginning about 600 collections of water including ponds and marshy places hitherto lying full with aquatic vegetations were cleaned and maintained upto the middle of 1935 when another contract was made for cleaning and maintaining 345 tanks and marshes which is still being done.

Fieldwork—The whole area of half a mile radius around the railway colony was divided into six blocks. All water collections in the blocks were systematically examined twice a week. Anopheline larvæ found during such examination were identified and recorded with a view to make out the species of anopheline mosquitoes breeding in them and the larval control measures were based on the findings.

ANTILARVAL MEASURES

1. *Parisgreening*—We started parisgreening suitable water collections and other places once a week but as the film of parisgreen was totally destroyed with a slight shower and easily swept to the direction of the prevailing wind in clean tanks it failed to have the desired effect on larvæ with weekly treatments and we had to increase the frequency to twice a week and sometimes more. Our experience of the place is that during the season when antilarval measures are very much needed parisgreening is a very tedious and costly affair.

Oiling—We used 'Malariol' for oiling which though a little costlier than other brands invariably gave good results but it could not be used in a large number of tanks partly owing to opposition from their owners and partly due to the belief that it kills small fishes in the tank.

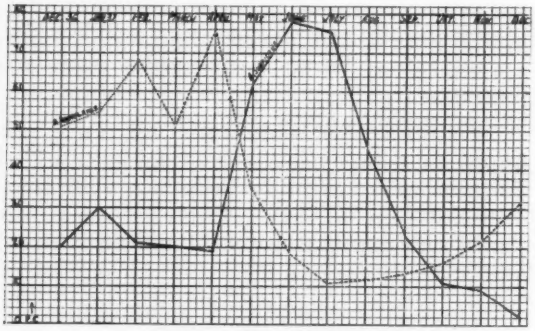
Anopheline Fauna of Lillooah

Four dangerous types and eight non-carrier varieties were identified in our laboratory. The particulars are given in the following table:

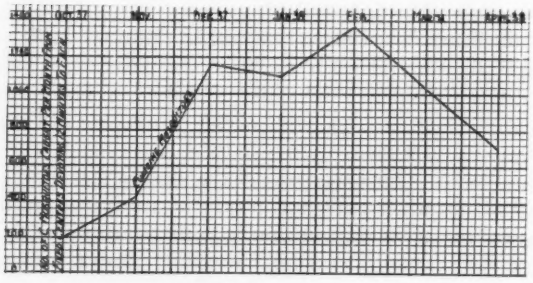
Dangerous Type	*Non-carriers*
A. philippinesis.	A. annularis.
A. culicifacies.	A. aconitus
A. minimus V. varuna	A. barbirostris
A. ludlowii (sunduicus)	A. hircanus
(occasionally recorded)	A. pallidus
	A. ramsayi
	A. subpictus
	A. vagus

Seasonal Variations in Mosquito Prevalence at Lillooah and its Environs

There are well marked variations in the prevalence of anopheline and culex at different seasons of the year. The maximum prevalence of anopheline mosquitoes is recorded during monsoon months while intolerably heavy prevalence of culicine mosquitoes is recorded from November to March. Graphs 2 and 3 show the details.



Graph 2—Showing Seasonal Prevalence of A. subpictus, A. annularis at Lillooah. Percentages Calculated from Total Monthly Catch of Anopheles



Graph 3—Showing Seasonal Prevalence of Culicine Mosquitos at Lillooah.

Anti-Adult Measures

Spraying of insecticide oils—We used 'Spry spray' which was regularly sprayed with Shell-Tox sprayers once every week or more in rooms of all railway buildings. The spray used to bring down almost all the adult mosquitoes within 10 to 15 minutes which were then collected and destroyed.

Ento-ray—A machine was installed as an additional means of destroying adult mosquitoes specially culicine, the heavy influx of which from November to March created an intolerable nuisance at Lillooah. I performed some interesting experiments to find out what role the machine could play in a scheme of anti-malaria control. The details of the experiments and the conclusions drawn from them form the subject matter of another article. I could, however, mention here that the performance of the machine was not to our satisfaction.

Anti-Parasite Measures

Examination of blood of every fever case was carried on and positive cases of malaria thus described were treated with atebrin or quinine followed by a course of plasmochin. Positive cases among inferior staff were admitted in the railway hospital for adequate treatment and "screening" so that susceptible anopheles, if present, were prevented from picking up infection and transmitting the same to others. The following table gives the idea of the benefits derived through antiparasitic measures.

Table Showing Laboratory Result on the Examination of Blood Slides (for M.P.) of Fever Cases Among Employees and Their Familie, Living Inside the Colony at Lillooah

Year.	*Total No. of cases examd.*	*Total No. of cases found positive.*	*Percentage of cases.*	*Remarks.*
1933	89	43	48·3	Slides examined Oct. Nov. & Dec.
1934	221	39	17·6	Slides exm. throughout the year.
1935	226	16	7·1	Do.
1936	172	7	4·0	Do.
1937	117	7	5·9	Do.
1938	173	6	3·4	Do.

Results

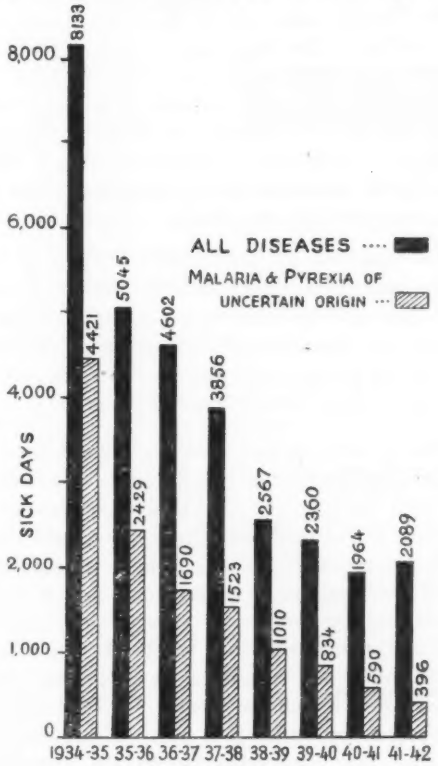
Systematic working of the aforesaid measures have brought down the sickness due to malaria and pyrexia of uncertain origin from 1104 per mille in 1933-34 to 151 per mille in 1938-39 and also reduced the sickness due to other diseases to a considerable extent. The actual figures giving all the necessary information is given in the following table:

TABLE GIVING NECESSARY DATA FOR SIX YEARS TO SHOW THE RESULT OF ANTI-MALARIA CAMPAIGN AT LILLOOAH

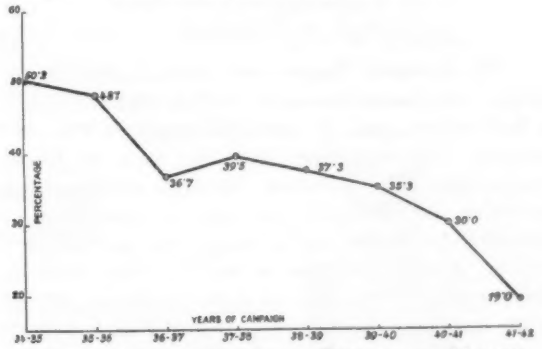
Particulars	*1933-34*	*1934-35*	*1935-36*	*1936-37*	*1937-38*	*1938-39*
Strength of staff	896	898	899	899	900	901
Rainfall	54·4"	35·3"	70·3"	—	—	—
Sickness due to malaria & pyrexia of uncertain origin at Ry. hospital	994	535	384	280	192	136
Sick days lost due to malaria and pyrexia	—	3979	2186	1521	1371	904
Sickness due to all diseases at railway hospital	—	7320	4561	4121	3471	2343
Splenic index	—	80	40	0·08	2·1	1·9
Cost of Engineering project and tank clearing	—	Rs. 663/-	15,000/-	4000/-	2750/-	2540/-
Cost of staff and materials ..	—	Rs. 4575/6/-	4596/-	4196/-	4196/-	4596/-

Note—Sickness of families is not included in the above figures as it is not reliable for statistical purposes.

Adjacent to our colony is the Lillooah Charitable Dispensary maintained by the Belur Municipality. The patients treated at this dispensary mostly come from the population residing within our control area. It stands to reason that the figures of malaria sickness of this dispensary should also show gradual fall giving an extra proof of the beneficial effects of antimalaria work undertaken by us. I have, therefore, obtained the figures from this dispensary which show that malaria sickness has gone down from 594 per mille in 1934 to 65 per mille in 1938 (*vide* Graphs 4 and 5). The actual figures given in the following table speak for themselves:



GRAPH 4—SHOWING COMPARATIVE FIGURES DEMONSTRATING THE EFFECT OF ANTI-MALARIA TREATMENT.



GRAPH 5—SHOWING PERCENTAGE DECREASE OF MALARIA TO ALL DISEASES' SICKDAYS.

TABLE SHOWING THE EFFECTS OF ANTI-MALARIA CAMPAIGN AT LILLOOAH ON THE SICK RECORDS OF LILLOOAH CHARITABLE DISPENSARY (BELUR)

Year	*Particulars*	
	Sickness due to malaria & pyrexia of uncertain origin.	*Sickness due to all diseases.*
1933 ..	2139	6800
1934 ..	1311	6240
1935 ..	469	5272
1936 ..	470	5047
1937 ..	470	5467
1938 ..	470	5540

SUMMARY

Details of anti-malaria work and the results obtained at the Lillooah Railway Settlement are given to prove that systematic work done honestly on accurate scientific lines never fails to give desired results.

ACKNOWLEDGMENT

My thanks are due to Dr. F. E. R. Laborda, the Chief Medical Officer, E. I. Railway for his guidance in the preparation of this paper and his permission to publish it. I appreciate the help given to me by the Malaria Inspector, Lillooah in collecting the information for this paper.

JOURNAL OF THE

INDIAN MEDICAL ASSOCIATION

CALCUTTA, AUGUST, 1942

MEDICINE IN U. S. S. R.

. . . . Diseases desperate grown
By desperate appliances are relieved
or not at all—Shakespeare.

The history of Russian medicine is a tale of terrific plagues and famines, of some brilliant achievements in a few centres, and of utter inadequacy in the open country. The beginnings were the same in Russia everywhere. For centuries Russian medicine was primitive medicine, folk medicine, a combination of empirical knowledge and of magic rites and religious beliefs. As a matter of fact, at the time of the revolution there were still large sections of the population that had never seen a physician but were treated in case of illness by medicine men and witch doctors.

Until the nineteenth century the rural districts had scarcely anything except folk medicine. Epidemics of plague, small pox and typhus swept over the country. Crop failures caused widespread famines at regular intervals. Millions of people succumbed to these visitations. But the population was fertile. New children were born and life went on.

Since the introduction of western medicine by Peter I, Russia produced brilliant medical men such as Nikolai Ivanovich Piragov (1810-1881), Sechenov (1825-1905) KravKov (1865-1924), Elie MechniKov (1845-1916), Ivan Petrovich Pavlov (1849-1936). Inspite of this individual brilliance and intellect the general population was deprived of medical care till very lately. The number of physicians and nurses were meagre. The Soviet medicine was not created from air; there were foundations to build upon. There was a scientific tradition in Russian medicine. It is always good to have traditions for a foundation so long as one is aware that traditions oblige him to look into the future and not backward. There were universities training good physicians. There was a medical organisation giving service to the rural population.

And yet, in 1914, when the world war broke out, medical conditions were far from satisfactory. The number of universities was much too small and as a consequence, there was a tremendous shortage of physicians. Their number was entirely out of proportion to the vastness of the territory. Zemstvo medicine, after half a century of development, was still in a rudimentary state. There was no central medical authority in the country; public health was administered by not fewer than eleven government departments. An economic system that gave wealth to a few and poverty to most, a government system that gave privileges to a few and handicap to most, a bureaucracy that impeded and obstructed the whole life of the nation—all these factors prevented the people from receiving what medical science could have given them.

As a consequence, the health conditions of Russia were very bad. The death rate for every 1,000 inhabitants averaged 28·4 to 30 from 1904 to 1914. The infant mortality per 1,000 children born from 1901 to 1911 averaged 244. Russia was still the playground of contagious diseases. In 1914 there were 11,843,088 cases of acute infectious diseases reported. How many more cases were not reported?

To reorganise the public health system of Russia in 1914, looked immensely difficult. The task seemed almost hopeless when after eight years of Imperialist and civil war, almost all medical facilities of the country were broken down, when famine and epidemics were ravaging the land with unheard of violence.

The U. S. S. R. undertook this difficult task. The main principle throughout was the prevention of disease. Now the administration of the medical services is based on Article 120 of the Soviet Constitution[1] which enacts that all citizens of the U. S. S. R. have the right to free medical services and to maintenance in the event of sickness, old age or loss of capacity to work. The people's Commissariat for Health has a Planning Department, which submits a comprehensive and co-ordinated plan for all the Health Services—preventive and curative—of the U. S. S. R. forming a part of the State Five-Year Plan which governs the economic and

[1] Dr. Joan McMichael—*Post Graduate Medical Journal*, Vol. 18, Jan., 1942, p. 12.

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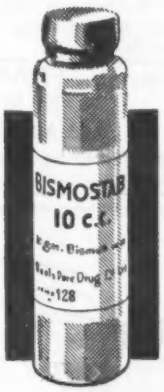

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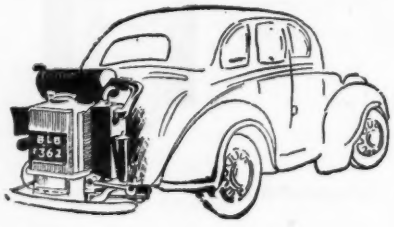

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social life of the country. The budget is made to fulfil the programme and the planning does not depend on the probable income. The main income of the budget is made from social insurance, local and state budgets and from consolidated state budget.

The Soviet Union has built up the basic units which are called the health protection stations in the factories, workshops, mines, State and collective farms and so on. From here, for more skilled or specialised treatment the patients are transferred to a polyclinic or hospital. A health protection board of the local Soviets supervises the medical establishments, organises the sanitary inspection of the area and makes provision of educational facilities to popularise the teaching of hygiene and public health protection.[2]

The State Medical Services provide security for members of the medical profession. A medical student has his choice of career. According to his choice, and the standard he achieves and after necessary specialisation and experience in a hospital, he is immediately absorbed into academic medicine, research or specialisation or general practice in an urban or rural area. The State offers certain inducements to doctors to go to the rural area *e.g.*, a free house, a free car, longer holidays on full pay and compulsory post-graduate courses on full pay with all expenses met, every three years. A doctor's consulting room and equipment are also provided by the State. Already the U. S. S. R. has produced many world renowned doctors *e.g.*, Filatov for his technique for the transference of cadaveric corneal graft to the living, Judin for the development of blood transfusion from the cadaver, and radical surgery in perforated and bleeding peptic ulcer, Burdenko for his works on neuro-surgery. (It may be mentioned that Burdenko is now head of the medical services of the Red Army). Use of umbilical cord blood prophylactically against measles, the combined enquiry of a doctor, an engineer and a chemist in case of accidents in factories, extensive use of vaccination with B. C. G., crêches for the pre-school children and infants of the women workers are some of the improvements popularised.

Energetic campaign against disease has made surprisingly rapid progress in all directions. Typhus fever is now almost a curiosity. The small pox morbidity was 0·025 per 10,000 population in 1936. By the same year (1936), the infant mortality was brought down to 118 per 1000. The tuberculosis mortality per 10,000 for Moscow came down from 22·6 in 1913 to 11·0 in 1938.[3]

The Anglo-Soviet Medical Committee, under the presidency of Sir Alfred Webb-Johnson, President of the Royal College of Surgeons, has pledged to work for the maximum exchange of medical knowledge, now and in the future. This will remove much of the mutual suspicion on both sides.

For us we will watch with interest the development of, almost unnoticed by the rest of the world, a new system of medicine in which prevention of disease is the all-pervading theme. It is possible that this great Union of Nationalities has shown us the beginning of a new era in the glorious history of medicine.

[2] For details see Socialised medicine in the Soviet Union by Henry E. Sigerist.

[3] Sir Cuthbert Sprawson—*Post-Graduate Medical Journal*, Vol. 18, Jan., 1942, p. 16.

TO BE PUBLISHED IN THE NEXT ISSUE:

Effects of Sulphanilamide on Small-pox by Drs. S. G. Vengsarkar, M.D., F.C.P.S., T. U. Poonen, B.A., M.B.B.S. and S. A. Walavalkar, M.B.B.S.

Deterioration in Physiological Activity of Digitalis by Dr. B. Chatterji, M.B., M.SC.

Some Clinical Aspects of Amœbiasis by Dr. G. B. Young, M.B., CH.B.

Contraction Ring as a cause of Dystocia by Dr. K. C. Shah, M.R.CO.G. (Lond.), D.C.H., R.C., P. & S. (ENG.), etc.

Ring Worm in Vizagapatam by Dr. V. Govindan Nair, M.R.C.P., F.R.F.P.S.

A Preliminary Report on the Treatment of Angiospastic conditions with Ergot and Nicotine by Dr. N. M. Jaisoorya.

CURRENT MEDICAL LITERATURE

MEDICINE

Pneumonitis or Virus Pneumonia

Longcope (*Practitioner*, 1942:148:1) writes that there is a more or less prevalent form of a typical pneumonia which has occurred in small epidemics throughout the United States—this disease can be differentiated on a number of counts from pneumococcal lobar pneumonia or from bronchopneumonia caused by the common bacterial forms. The disease may occur in a mild form, a moderately severe form or in such a violent form that death may occur. Racking cough with little sputum, high fever, moderately slow pulse, a striking disparity between the physical signs and x-ray shadows, often spreading from one lobe to another, lack of leucocytosis during the early stages, a prolonged febrile course with termination by lysis, characterize the clinical course. Complications are not numerous. The pathological lesion is a hæmorrhagic bronchopneumonia, with red blood cells, mononuclear cells and coagulated fluid in the alveoli. The ætiological agent appears to be a virus, which is not the influenza virus. The disease is not affected favourably by sulphonamides or known derivatives.

Alkaloids of Rauwolfia Serpentina: A Comparative Study of Their Pharmacological Action and Their Role in Experimental Hypertension

Chopra and others (*Indian J. Med. Research*, 1942:30: 319) from the comparative study of the different active constituents of R. serpentina observe that the extract, total alkaloids, and serpentine shows marked hypotensive properties and that ajmaline and serpentinine on the contrary are hypertensors. In experimental hypertension all of them induced hypotension, serpentinine producing the maximum effect amongst them. Serpentinine is considered to be the chief pressure reducing factor amongst Rauwolfia alkaloids. Ajmaline and serpentinine stimulate whereas serpentine depresses the intestine. The first two account for the purgative effect of the extract which has been reported in the Ayurvedic literature. Rauwolfia alkaloids probably act on the vasomotor system and also directly on plain muscle of the blood vessels and intestines.

Haemoptysis

Ellman (*Med. Press*, 1942:207:174) writes that the differential diagnosis of hæmoptysis is an important clinical problem. Pulmonary tuberculosis, bronchiectasis, carcinoma of the lung and mitral stenosis are among common causes of hæmoptysis. Almost any lesion of the respiratory tract may be responsible for the expectoration of blood stained sputum, if not for a true hæmoptysis. Broadly speaking the commonest causes of hæmoptysis, taking different age periods and placing them in their order of frequency are: *In childhood:* bronchiectasis, mitral stenosis, pulmonary tuberculosis. *20 to 40 age period:* pulmonary tuberculosis, bronchiectasis, mitral stenosis. *40 to 60 age period:* new growths of the bronchioles, pulmonary tuberculosis, bronchiectasis. Obscure cases of hæmoptysis should be dealt with on the following broad lines: (*a*) a carefully obtained history, (*b*) a complete clinical investigation, (*c*) examination of the sputum, (*d*) x-ray investigation of the chest in various planes (*e*) bronchoscopy and (*f*) bronchography.

Prognosis of Pneumococcic Meningitis Treated with Chemotherapy

Hallander (*Am. J. Med. Sci.*, 1942: 203:370) gives in the following lines the summary of his observations:—

1. The clinical results obtained in the treatment of 160 reported cases of pneumococcic meningitis with chemotherapy bear out experimental results that sulphapyridine is the drug of choice in the treatment of this infection. 2. At present there is no clear evidence that the additional use of specific serum should be a routine procedure. The percentage of recovery with sulphapyridine alone is approximately that of combined sulphapyridine-serum therapy. The combination is indicated in the treatment of type III and V pneumococcic meningitis, in those infections secondary to an oto-rhinologic condition and to pneumonia and in younger age groups. 3. No definite correlation could be made between the dose of the sulphonamide drug used, its concentrations in both blood and spinal fluid and the clinical response. 4. The prognosis is favourable if the cerebrospinal fluid is sterilized within 4 days with the use of sulphapyridine. 5. The prognosis in pneumococcic meningitis secondary to pneumonia is poor, possibly due to an acquired tolerance of the invading organism to the sulphonamide drug. 6. The prognosis in the younger age groups is improved with the use of combined drug-serum therapy, with the best prognosis occurring in the ages from 10 to 20 years. 7. In 9 cases of pneumococcic meningitis treated at Jefferson Hospital with chemotherapy only 1 recovered. Two other cases (types III and X) apparently recovered but died following unsuccessful treatment of a relapse. The recovered cases received combined treatment.

The Absorption of Glucose from the Human Rectum

Garrer and others (*Acta Med. Scand.*, 1941:107:1) in reporting on the effect of giving isotonic and hypertonic solutions of glucose, galactose or lævulose in small quantity by rectum to 4 human subjects observe that the amount unabsorbed was recovered one or two hours later by rectal lavage, that less than 1 gm. of these sugars was absorbed per hour from the rectum and the blood sugar level was practically unaffected. The absorption of sugar from the distal portion of the large intestine is by diffusion only and the therapeutic value of glucose enemata is questioned.

Treatment of Peptic Ulcer without Alkalis

Dick and Eisele (*J. A. M. A.*, 1942:118:38) report that under hourly treatment with milk and cream without the use of alkalis, the speed of healing of gastric and duodenal ulcers compares favourably with that under other methods of treatment. Such treatment of a series of 41 patients brought about (1) the prompt disappearance of the symptoms and the complete comfort of the patient, (2) disappearance of the occult blood from the stool when it was present, and (3) the disappearance of the x-ray crater.

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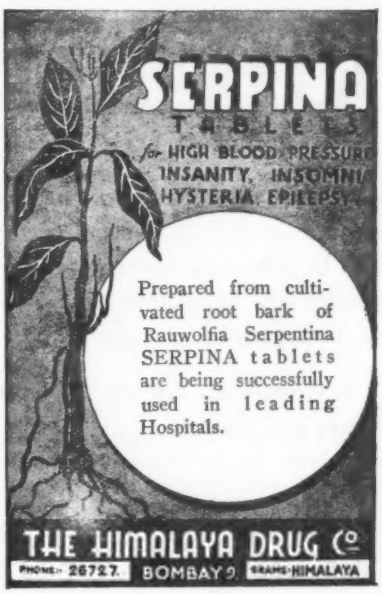
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The Use of Vitamin B_1 in the Treatment of Neuritis and Neuralgia

Kalaza (*Acta med. Scand.*, 1941:107:427) in reporting on the results of vitamin B_1 therapy in 49 cases of neuritis and 9 cases of neuralgia with intravenous injections of 50 mg. of vitamin B_1 given daily for 4 to 16 days observes that of 27 cases of neuritis in which cure was obtained, 5 had polyneuritic symptoms after acute infections, 5 had polyneuritis with diabetes, 3 were suffering from neuritic symptoms associated with severe vomiting of pregnancy, 3 were cases of alcoholic neuritis and 11 had chronic neuritic symptoms of various origin. No cure was obtained in 5 cases of herpes zoster, 2 of tabes dorsalis, 3 of nervous symptoms associated with pernicious anæmia. No relief was obtained in 2 cases of trigeminal neuralgia and 7 of sciatica. The author suggests that in the cases where vitamin therapy was successful the underlying cause of neuritis was nutritional deficiency.

Endocrine Factors in Acne Vulgaris

Cohen (*Brit. J. Dermat. & Syph.*, 1941:52:231 & 269) in reviewing the literature on the subject points out the following facts amongst others: Acne does occur with abnormal frequency in conjunction with certain disorders of the endocrine system, such as tumors of the suprarenal cortex and arrhenoblastomata; also during the administration of androgens, *e.g.*, testosterone propionate. Apart from these, it does not occur regularly in major endocrine disorders. The strongest arguments in favour of an endocrine aetiology are the regularity of its appearance at puberty and its variation with the menses. It appears probable that certain changes in the skin—possibly in the direction of Darier's kerosis—are necessary before acne can develop and these changes are brought about, at least in part, by quantitative alterations in the circulating hormones. The endocrine effect on the skin infection and its spread may possibly play a part.

Evaluation of the importance of the changes in the carbohydrate metabolism are made uncertain by the difficulty of being sure to what extent they are endocrine or alimentary in origin. There is no strong reason to believe that it is at all abnormal in acne although Semon and Hermann's work on treatment with insulin is suggestive.

Particular confusion exists with regard to the results of treatment. It appears that, in those cases in which some disorder of the endocrine system is clearly present the treatment of that disorder will also improve the acne; beyond that it is as yet impossible to go.

SURGERY

Pulmonary Abscess

Touroff and Neuhof (*J. Thoracic Surg.* 1941:10:618, *Ref. Brit. M. J.* 1942:1:443) write that the treatment of pulmonary abscess depends on the recognition of the variety of abscess, putrid or non-putrid. In a putrid abscess the infection is apparently by anærobic bacteria. It begins as a localized area of gangrenous pneumonitis resulting from the aspiration of infected matter from the mouth or upper respiratory passages. The material gets arrested in one of the smaller bronchi or bronchioles and the lesion is, therefore, situated in the periphery of the lung. Rapid necrosis follows and within a week of infection radiography often shows a unilocular cavity surrounded by only a narrow zone of infiltrated atelectatic lung. An intense overlying pleuritis is present. The sputum or breath is characteristically fetid. A non-putrid abscess is initiated by ærobic organisms and begins as an area of bronchopneumonia. The expectoration, after a variable interval, of frankly purulent non-fetid sputum indicates that the pneumonic process has become suppurative and necrotic. Various changes may result in the non-putrid abscess assuming any one of four forms: (1) excavation in the midst of an extensive area of inflamed, suppurating and necrotic lung; (2) the same as in (1) but with excavation more advanced; (3) typical pulmonary abscess surrounded by a narrow rim of pulmonary infiltration (like that noted in cases of putrid abscess); and (4) multiple scattered lesions of the above three types in various combinations. The authors emphasize the importance of fetor of the sputum or breath (there may be no sputum if the draining bronchus is blocked) and in the differentiation of the two varieties of abscess advise diagnostic bronchoscopy for detection of fetor when doubt concerning this exists. Acute putrid abscess subsides much less often under conservative treatment than does acute non-putrid abscess of type 3 which it resembles. The explanation is probably to be found in the different causative organisms. The treatment of putrid abscess is essentially surgical whereas that of a non-putrid abscess is essentially non-surgical. Surgical treatment is indicated in non-putrid abscesses of all types when the lesion is complicated by perforation of the pleura. Operation may also be indicated in non-perforated type 3 abscess when the clinical manifestations are severe and radiological evidence supports clinical impression of an advancing lesion.

Influence of Laxatives on Gastro-Intestinal Motility

Bruck and Fruchter (*Radiology*, 1942:38:145) in reporting on the study of the influence of a single dose of commonly used laxatives on gastro-intestinal motility observe that the laxatives studied were cascara, compound liquorice powder, magnesium citrate, magnesium sulphate and castor oil, that three normal individuals were studied for each laxative, a control study of each individual being made about a week or ten days preceding the study with a laxative and that films were made immediately, and at one hour, three hours, four hours, six hours, eight hours, twenty-four hours and forty-eight hours after the meal. The following results are observed: *Stomach*—cascara and liquorice produced no alteration in gastric evacuating time whereas both the magnesium salts and castor oil produced delayed gastric motility. *Intestines*—all laxatives produced an initial irritability of the proximal jejunum lasting one to three hours; with magnesium salt there was definite delay in the passage of the meal through the small intestine, whereas the other laxatives showed moderately increased small intestinal motility. *Colon*—compound liquorice powder and castor oil, of all five laxatives used, produced the most satisfactory and complete emptying of the colon; the two magnesium salts showed more retention at forty-eight hours than the control, in spite of numerous bowel movements. Thus castor oil and compound liquorice powder are the best laxatives for colonic clearing in preparation for x-ray examinations.

Practical Consideration of Cancer of the Sigmoid and Rectum

Stephens (*South. M. J.*, 1941:34:812) writes that the three definitely significant symptoms of carcinoma of the distal portion of the large intestine and rectum are (1) the passage of bright red blood from the rectum either alone or with the stool, (2) progressively increasing difficulty in the ability to evacuate the bowels and (3) periods of such difficulty alternating with periods of frequent evacuations of a fluid nature. In the presence of these symptoms digital and proctoscopic examination must be made. Factors influencing operability include age, loss of weight, anæmia, general debility, specific diseases such as diabetes and tuberculosis, the size and fixation of the growth and metastases. The combined abdomino-perineal operation is the one of choice but multiple stage operations and posterior resections have their place depending on the condition of the patient and the ability of the surgeon. Permission of a 'probale' colostomy should always be obtained.

Immediate Feeding *versus* Initial Starvation in the Treatment of Bleeding Peptic Ulcer

Eichhorn (*Am. J. Med. Sci.*, 1942:203:429) from comparative study on 81 patients with bleeding peptic ulcers of which 43 were deprived of food and 38 were fed immediately observes that immediate liberal feeding results in (1) a greatly lowered mortality rate, (2) more comfort for the patient, and (3) a shorter hospital stay.

Effect of Thiamin Chloride on Cardiospasm and Achalasia of the Oesophagus

Stinson (*Ann. Otol., Rhin. & Laryng.*, 1941:50:898) from the marked analogy between the effect of avitaminosis B_1 on the motility of the bowel and the findings in cases of cardiospasm which have come to autopsy, has propounded the following theory as to the steps in the development of cardiospasm: Anorexia, the first symptom of deficiency of vitamin B_1 leads to further deficiency. An early finding of B_1 deficiency being dilatation of the colon it can be assumed that the same occurs in the œsophagus. With dilatation of the œsophagus and loss of motor stimulus through degeneration of Auerbach's plexus, stasis of food follows as the result of loss of the propulsive force of the œsophageal walls rather than by reason of constriction at the cardia or in the liver tunnel. Adhesions between the folds of the mucosa develop through maceration of the mucosa caused by detritus lying in the œsophagus. Ptosis of the diaphragm by reason of vitamin B_1 deficiency further complicates the picture, so that in the advanced stage one finds all the factors put forward by previous workers increasing the obstruction but occurring as secondary factors. Thus the primary obstructive factor in cardiospasm is the lack of propulsive force in the walls of the oesophagus rather than obstruction at the cardia. Cardiospasm is frequently a manifestation of avitaminosis B_1. Vitamin B_1 given intramuscularly will relieve an attack of cardiospasm in many instances and continued administration of vitamin B_1 will prevent recurrence of attacks of cardiospasm in these cases. The author, of course, sounds a note of warning that every obstructive lesion must be subjected to an œsophagoscopy and response to thiamin chloride is not sufficient evidence upon which a diagnosis is to be based. Illustrative case notes are given.

Laryngeal Tuberculosis: A Study of 500 Cases of Pulmonary Tuberculosis with a Resume Based on 28 Years of Experience

Dworetzky and others (*Ann. Otol., Rhin. & Laryng.*, 1941:50:745 writes that laryngeal tuberculosis is definitely on the decline. The incidence has dropped from 25·6 per cent in 1914 to 14·6 per cent in 1934, to 3·6 per cent in 1941 and the reasons for this are: (a) improved case findings, (b) improved methods of diagnosis, (c) earlier treatment, and (d) increased employments of collapse therapy. The author further observes that laryngeal tuberculosis is always secondary to pulmonary tuberculosis and larynx becomes infected chiefly in two ways: (a) surface infection usually occurring in the bronchogenic cases of pulmonary tuberculosis where the tubercle bacilli invade the larynx by penetrating the mucous membrane; (b) blood serum—this form of invasion usually occurs in the hæmatogenous cases of pulmonary tuberculosis where the larynx often becomes involved simultaneously with the lung. Prognosis, as far as the larynx is concerned, is as a rule good in the bronchogenic cases, specially, it is favourable where collapse therapy is successfully applied. In the hæmatogenous cases, however, the prognosis depends largely on the character of the infection—it is invariably hopeless in the generalized miliary cases but in cases where the infection of the lung is mild, the laryngeal lesion often clears up without much therapy of any sort. The laryngeal lesions in bronchogenic cases usually require little treatment—the larynx will clear with improvement of the lungs; while in the hæmatogenous cases, treatment of the peracute larynx is of no avail, the patient dying of inanition and in these cases the best way to alleviate dysphagia is through the injection of the superior laryngeal nerve with 85 per cent alcohol, such injections bringing relief for several weeks and sometimes for months.

OBSTETRICS AND GYNAECOLOGY

Haemorrhage in Obstetrics

Moir (*Practitioner*, 1942:118:129) deals with the subject under the headings of placenta prævia, accidental hæmorrhage, post-partum and third-stage hæmorrhage and hæmorrhage due to retained placenta.

Placenta prævia. In the absence of evidence to the contrary, every bleeding before the onset of labour should be assumed to arise from a detachment of a low-implanted placenta. However, in every case of ante-partum hæmorrhage early examination is, therefore, recommended as then only can the significance of the bleeding be judged. As soon as a diagnosis is made of placenta prævia the patient should be sent to a hospital for treatment. The author divides all cases of placenta prævia into two groups, major and minor—placenta prævia major, when the placenta covers the internal os or lie within easy reach of the examining finger; placenta prævia minor, when the placenta encroaches on the lower uterine segment but lies well clear of the internal os. Sometimes the os is tightly closed; if, however, the manipulation provokes fresh bleeding the major variety should be at once suspected. The treatment will be different in two groups. In the major variety any manipulation from below will add to the loss of blood and cæsarian section performed while the patient is still in good condition is the safest and best treatment for both mother and fœtus. In the

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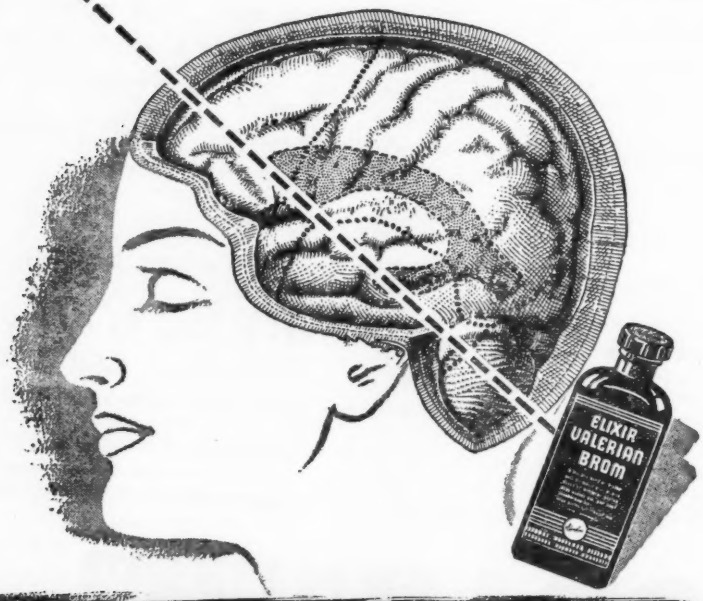

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minor variety when the placental edge is felt high and the patient is in labour or near term, rupture of the membranes and application of a tight binder are usually all that is necessary. In these cases Willett's forceps can be of use—if delivery is not accomplished in six to eight hours the forceps should be removed. Bipolar version followed by plugging the lower uterine segment with the fœtal half-breech has its uses, and in sudden emergency can be a valuable and even life-saving operation. However, it is seldom necessary in minor degrees of prævia nor is it without dangers of its own—maternal morbidity and fœtal mortality is high. Vaginal packing, though a common treatment of placenta prævia, has the following drawbacks: there is an increased risk of sepsis, the chances of a safe cæsarian section is flittered away by hours of sodden pack and there is no guarantee that bleeding will not recur when the plug is removed or expelled. However, vaginal packing, if properly done, has a small but important place in treatment.

Accidental hæmorrhage. The milder cases are difficult to distinguish from the milder cases of placenta prævia but fortunately the distinction is not of great moment as treatment is on similar lines. The concealed variety with hard painful uterus should be treated by measures to counteract shock. The author favours rupturing of the membranes as soon as the shock shows signs of diminishing—there is spontaneous delivery within 12 hours. If, however, the uterus increases in size (by girth measurement) cæsarian section may become an urgent necessity but it must be rememberd that surgery in the condition is a risky venture.

Post-partum and third-stage hæmorrhage. It is sometime caused by maintaining a deep ether or chloroform anæsthesia during and after forceps extraction of the fœtus—a chloroformed uterus is a relaxed uterus and dilated blood sinuses can shed a large quantity of blood. Sometimes the bleeding comes from the torn artery in the cervix, vagina or perineum. If stitches cannot be applied, the insertion of a firm gauze pack, introduced through a tubular speculum may be a life-saving measure. Oxytocic drugs, such as pituitrin may be useful in stopping the post-partum hæmorrhage but it should be used cautiously and should not be repeated in half an hour as severe and fatal shock often follows quickly repeated injections. If the patient's blood pressure is low, pitocin or the ergot alkaloid ergometrine may be used safely.

Hæmorrhage due to retained placenta. 'Crede's expression' should be made only when the uterus is actively contracting; the manœuvre at any other time is highly dangerous. However, sometimes the placenta cannot be expressed—manual removal is necessary and that without delay for serious blood loss adds enormously to the risk of sepsis.

Mental Disorders in Pregnancy and the Puerperium

Skottowe (*Practitioner* 1942:148:157) gives in the following lines the summary of his observations: 1. The chance of a child-bearing woman becoming seriously psychotic is one in a thousand. 2. The psychosis is not specific to child-bearing: it may be a confusional state, schizophrenia or an affective disorder; obsessional neuroses are also seen. 3. Confusional states are nearly six times more frequent in psychosis with child-bearing than in psychosis occurring in non-child-bearing women of the same age-groups and they form nearly one half of all psychoses associated with child-bearing. 4. There are always causal factors additional to the mere fact of child-bearing—they are: hereditary predisposition in half the cases irrespective of type; and bodily and mental strains arising from the child-bearing in two-thirds of them, bodily strain predominating in the confusional state and mental strains in the affective disorders. 5. Between one-third and one-half of the cases become psychotic in the first two weeks of the puerperium. 6. Confusional states carry a mortality rate of 15 to 20 per cent, but if the patient survives she practically always recovers. 7. Schizophrenic cases rarely recover and such patients often become chronic hospital invalids; these cases are seldom seen in multiparæ. 8. Serious affective disorders tend to start later in the epoch than other psychoses, they end in recovery; mild reactive affective disorders, recovering spontaneously, occur early in pregnancy. 9. Of all cases about one-half could have been predicted; termination should be considered if a patient with recognizable causal factors and any psychiatric symptoms at all is seen early in pregnancy. 10. Two-thirds of cases show a risk of infanticide or suicide at some stage. 11. Home treatment is suitable only for quiet confusions and mild affective disorders; other cases require mental hospital treatment but need not necessarily be certified to obtain it.

Hyperemesis Gravidarum and High Vitamin Therapy

Watt (*J. Obst. & Gynæc. Brit. Emp.*, 1941:48:619) advocates the treatment of hyperemesis gravidarum with large doses of vitamins, specially B_1. When the vomiting has been severe and has continued for sometime avitaminosis in some degree will undoubtedly be present and it may be necessary to give the vitamin by intramuscular injections. When the patient can take anything by mouth these vitamins (A, B, C and D) in high concentrations can be given in capsule form. Nutrient substances may be given, if necessary, through a small duodenal tube passed through the nose. When dehydration is marked continuous intravenous infusion of glucose in normal saline is indicated. If there is no favourable response in 48 hours and if mental and nervous changes, jaundice or bile in the urine, retinitis or low blood pressure develop or if albuminuria persists or there is progressive rise in temperature or pulse rate, termination of pregnancy is indicated. If pregnancy is terminated, vitamin therapy should be continued.

Survey of Results of Repair and Amputation of Cervix

Solomons (*J. Obst. & Gynæc. Brit. Emp.*, 1941:48:461) in presenting a survey of 104 cervical operations with an evaluation of results based on his personal findings in the follow-up examination of each case observes that the procedure employed were Emmet's trachelorrhaphy, Schrœder's amputation and circular amputation, that of the 104 cases, 94 showed much improvement from operation and 70 were free of discharge and backache was the commonest residual symptom. The use of trachelorrhaphy in the child-bearing period is stressed specially in relation to fertility. 23 out of a possible 30 patients became pregnant following trachelorrhaphy. 72 of the entire series revealed completely healed cervices and in 1 a bad result was reported. No cervical carcinomas were found in the post-operative group; sepsis was absent and only 4 patients developed a secondary hæmorrhage.

NOTES AND NEWS

ABDOMINAL INJURIES IN MODERN WARFARE

For the Bradshaw Lecture to the Royal College of Surgeons of England Rear-Admiral G. Gordon-Taylor took as his subject "Abdominal Injuries in Modern Warfare."

His remarks were based on a series of over 600 operations for abdominal injury in casualties from Dunkirk, in the Navy and the R. A. F., but largely in air-raid casualties among civilians. In addition, though not included statistically in the review, there were cases of injury to the belly which had been received in circumstances more or less related to total warfare—for example, the black-out had played no small part in determining abdominal damage of this kind. Again, the catastrophe which befell the individual in peace might, of course, equally overwhelm him in war, and the series included cases of perforated peptic ulcer operated on during air raids and in the woods near Dunkirk beach, and cases of strangulated hernia which had been admitted to hospital during air raids and had taken their turn for operation with persons injured by high explosive.

The idea that the immediate mortality from abdominal injuries due to enemy action must be very high was not substantiated by the facts from the post-mortem room, which, in one particular series, showed that the number of immediate deaths due to abdominal injury represented no more than from 8 to 10 per cent of the total cases. "Experience demonstrates the fact that, despite the stout-hearted efforts of rescue squads and the courage and devotion of ambulance drivers in cities, desperate or moribund abdominal cases do not crowd the doorsteps of our hospitals, and it becomes difficult to escape the conclusion that, in Britain at any rate, abdominal casualties demanding surgical aid are few." Operations for abdominal casualties in the Forces also appeared to be infrequent in this war.

Penetrating Injuries—Most of the penetrating injuries in the series had been caused by fragments of bomb casing; the largest fragment to be removed in a successful case was the size of a walnut. The wounds produced by bullets did not differ greatly from those sustained in the last war, and the recovery rate for persons injured by revolver bullets was flattering to the operating surgeon. The destructive effects of flying glass were now familiar. Often coils of intestine were cut to pieces inside the belly. In some cases more than one type of missile was responsible for the damage; thus glass and bomb fragments might be found with stones and metal. Viscera might also be damaged by in-driven bone fragments, although the missile itself did not penetrate the peritoneal cavity. Only two cases of bayonet wounds (both recovered) were included in the present series.

The experience of this war confirmed that of the last concerning the occasional immunity of viscera in penetrating wounds of the abdomen. Moreover, wounds of the hollow viscera had been known on occasions to heal spontaneously without surgery. The importance of the buttock wound as a potential avenue to the abdominal cavity could not be stressed too strongly; the wound of entry was found in this region in about 20 per cent of all cases of abdominal injury. It was most important that the minute wound should not be overlooked, and one of the most useful surgical instruments in the reception room was a pair of large shears to cut away the patient's clothing and permit him to be examined all over. A patient with a large wound of the abdomen or a wide loss of the abdominal wall seldom recovered, though remarkable cases of recovery had been recorded.

The general condition of the wounded patient varied widely. In some the degree of shock was extreme, but others were able to walk and even to help their fellows. Secondary hæmorrhage had been an infrequent phenomenon in this war, and few cases were met with in this review. Primary hæmorrhage was a predominant cause of death in the early hours of wounding or in subparietal injury.

Prognosis in Stomach Lesions—The prognosis in lesions of the stomach was better than in the last war, when the recovery rate was 36·3 per cent. In the present series it was 60 per cent. Acute dilatation of the stomach had been strikingly frequent; not only had this phenomenon been a complication of a penetrating injury of the abdomen, but it had also proved a common and sometimes intractable sequel of operations and a complication of injuries to other parts of the body. It had occurred with contusions of the chest or in association with a fractured pelvis or ruptured bladder.

Three men suffering from perforated peptic ulcer were known to the lecturer to have been successfully evacuated from Dunkirk; two were operated on aboard and one on this side of the Channel. Prolapse of the abdominal viscera made the patient a bad surgical risk. The recovery rate in operations on prolapsed non-perforated small intestine in this war was about 50 per cent; when the small gut was not only extended but also injured the mortality was about 80 per cent. In prolapse of the large bowel the prognosis was very grave, but patients had recovered even when the large bowel had been prolapsed and lacerated. The number of perforations of the bowel in the intestinal cases investigated had varied from 1 to 20. Suture had been shown to be associated with better results than resection, and of the resections of the bowel in patients who had survived most had been of short lengths.

Wounds of the duodenum had a sinister reputation in previous wars. Successful operations for duodenal injury had been carried out by several surgeons in the present conflict. In injuries of the rectum in this series the recovery rate was 52 per cent, a great improvement on the 35 per cent of the last war; but the recovery rate in penetrating wounds of the bladder was slightly lower than the 40 per cent of 1914-18. The spleen had been frequently damaged by penetrating injury and also by falls in the black-out.

"Immersion blast" was known to naval surgeons in the last war, but more particular attention had now been drawn to it. Clinically the cases varied much in degree, from mere ileus to severe peritonitis after rupture of small or large intestine. The youngest "case" in which death occurred from blast was a 6 cm. fœtus with a bruise on the abdomen. A pregnant woman died shortly after receiving injuries in an air-raid shelter, and a typical appearance of blast injury was found post mortem in the uterus.

Percentages of Recoveries—Assessing the general prospects of recovery, Surgeon Rear-Admiral Gordon-Taylor said that despite the gravity of the wounds and the frequent association of multiple injuries, about 50 per cent of patients with abdominal injury due to enemy action for whom operation was possible had survived. The present military situation allowed no information as to the percentage of all abdominal casualties for which operation had been possible but on the home front most of the cases reaching hospital alive were given surgical aid. The percentage of recoveries for injuries to stomach, small intestine, rectum, and spleen was actually higher than in 1914-18, and for large bowel injuries it was the same as it was then. In his series of 163 cases which underwent operation for injuries of the large intestine, 65 recovered (40 per cent), and in 119 in which operation was carried out for abdominal injury confined to the small intestine there were 75 recoveries (64 per cent). Exteriorization operations on the large intestine had done badly. Sulphonamides locally and orally had proved of inestimable value. Transfusion of blood or blood derivatives had been employed on a liberal scale and made a host of cases operable. Far larger amounts of blood had been given than in previous wars—as much as 11 pints before operation became possible.

Surgeon Rear-Admiral Gordon-Taylor remarked in conclusion: "It seemed opportune and desirable to familiarize the scattered surgeons with the results that may be attained, and are in fact being attained, in the abdominal surgery of total warfare . Impressions are fallacious. The collection of these facts and the conclusions emanating from their study have both surprised and thrilled me with their unexpected excellence."—*B. M. J.*

LADY TATA MEMORIAL TRUST SCHOLARSHIPS

The Trustees have awarded seven scholarships of Rs. 150/- per month each for one year from July 1st, 1942, to Indians for scientific investigations having a bearing on the alleviation of human suffering. The recipients are Mr. S. Rajagopalan, who is to continue the work on synthesis of new Sulphanilamides, Mr. N. C. Datta, to continue investigations on certain aspects of the role of fat in human nutrition; Mr. K. Ramamurti, to work on the synthesis of ascorbic acid; Miss Mary Samuel, to carry on research on the effect of fat soluble vitamins on the histology and cytology of the female gonad and associated organs with special reference to vitamin A & E deficiency abortion; Miss Beatriz de M. Braganca, to work on dietary factors in relation to hæmopoiesis; Mr. S. Ranjan Das, for (1) construction of a vacuum tube apparatus for the generation of a copious supply of neutrons (2) therapeutical and biochemical applications of neutrons and x-radiations; Mr. M. V. Lakshminarayana Rao, to carry on research of insulin, carbohydrate metabolism and the cure of diabetes.

PUNJAB MEDICAL COUNCIL

At a meeting of the Punjab Medical Council held at Lahore, on 11-4-42, the following resolutions amongst others were passed:

Resolved that the registration fee be reduced from Rs. 20/- to Rs. 15/-.

Resolved that Dr. Miss Konika Mitra, L.S.M.F., be warned for issuing a testimonial in respect of medicine "Asnol" which testimonial was published in the press.

Resolved that the practice of obtaining second opinion by the Heads of Government Departments in cases of doubt be referred to a panel appointed by the Punjab Medical Council and not to any strictly Governmental Agency as the case is at present.

The Council resolved that the full details of the above resolution be worked out by the Executive Committee.

Resolved that the Punjab Medical Council request the Punjab Government to take steps so as to exempt the Registered Medical Practitioners from the provisions of the Punjab General Sales Tax Act in view of the fact that they are not allowed under the rules laid down by the Punjab Medical Council to be dealers in medicines.

Resolved that a deputation composed of the following members be authorised by the Punjab Medical Council to wait on the Hon'ble Minister for Education and explain to him the point of view of the Council supporting the resolution regarding the representation of the Punjab Medical Council on the Governing Body of the Punjab State Medical Faculty: Drs. Vishwa Nath, B. J. Sahni, Ch. Mohd. Nawaz and Capt. R. C. Goulatia.

GOVERNMENT AND QUININE POLICY

The following extracts are quoted from a letter received from the Government of India, Department of Education, Health & Lands, in reply to a memorandum submitted to them on the quinine policy of the Government, for the information of the members of the Association and of the profession, generally:—

"The whole problem of quinine supply is engaging the most serious attention of the Government of India. The possibility of increasing the production of quinine in India by various methods is being explored in consultation with the Governments of the producing Provinces, Bengal and Madras. In the meantime, every effort must be made to conserve the existing stocks of quinine in the country and to utilise them to the best advantage. In this connection the Association is in a position to lend valuable assistance by advising its members to observe the strictest economy in the use of quinine, more especially by refraining from prescribing it, alone or as an ingredient, for tonic or prophylactic purposes for which other drugs are equally efficacious."

BOOK REVIEWS

WHAT TO EAT AND WHY—By Eric E. Lieber. 1941. Pages xvi+126. 8 vo. Published by John Bale and Staples Limited, London W.1. Price six shillings.

The present war has been truly described "as a war of nutrition." This is most applicable to the United Kingdom where very little food is grown. That is the reason "what to eat and why" is so important. Lord Horder rightly points out in the foreword "Tightening the belt as a result of modern war means saying good bye to casual feeding habits and lending a patient ear to those who know so that we may learn what they have to teach."

In this small volume the author has lucidly explained the food problem to the lay reader. The chapters on "nutrition

and growth", "minimum food requirements of man at work" and "unusual methods of nutrition in war time" are very instructive. The dealing of the subject is clear and scientifically correct. To combine them in a book for the lay reader is no easy matter. We recommend the book to the medical profession and the public.

B. P. NEOGY.

SCIENTIFIC CURIOSITIES OF SEX LIFE—By Rustam J. Mehta. 1941. Pages viii+360. 8 vo. Published by D. B. Taraporevala Sons & Co. 210 Hornby Road, Bombay. Price Rs. 3/12.

Books dealing with sex have always produced curiosities in lay public. Much hush hush about sex in our life has increased this tendency. The reticence of the parents, guardians and teachers has given a background of secrecy and, consequently, an intense desire to know about it. In this book "Scientific Curiosities of Sex Life," the author has described abnormal life of persons and consequently disappointed many people, who really desire to know about it. I do not agree with the author when he quotes "The lay man also will find solace in the fact that he may at times refer those manifestations which offend against our ethical and aesthetic principles to a diseased condition of the mind or the body." It is just like giving a lecture on medicine to a person suffering from pneumonia. No useful purpose will be served. Abnormal persons should receive proper education and treatment in the hands of physicians. The back ground of this abnormal psychological development should receive careful handling. On the other hand many normal persons who cannot or have no opportunity to give vent to their normal feeling sometimes resort to abnormal ways. Here a natural outlet will often produce the desired cure.

The subjects of Lesbianism, Homosexuality, Reversal of Sex, Bestiality, Sadism or Sex life of Aborigines, etc., will only have pornographic interest in normal persons. Moreover, the discussions of the subject have been unhappy. Undue emphasis has been laid on the dramatic effect of these abnormalities in quoting liberally the case notes from various foreign books on the subject. One misses the sobriety of a scientific treatise. The scientific handling of the subject has been very poor. As for example, a layman cannot understand the developmental defects and anatomical similarities or differences of a hermaphrodite from a normal person unless the subject is dealt with properly and for this reason a certain amount of knowledge of normal anatomy is necessary. Quoting some cases from the lay press or some scientific books will only cause confusion.

It is sometimes difficult to draw a line between normal and abnormal sex affair. But to quote authors who think sodomy a normal instinct is the limit. People are at liberty to hold different views and certainly the last word has not yet been said on the subject. Instead of holding it as normal, the abnormal outlook should be diverted to normal channels.

The author has liberally quoted verbatim (with acknowledgment, of course) from various authors on the subject. There are almost no cases of his own which only shows the academic interest of the author. To develop proper scientific interest and not curiosities only, cases should be handled before writing on the subject. The dealing of sexual pathology is poor and insufficient to be of any value to a scientific mind. The author has worked hard in looking up many books on the subjects but it is unfortunate that his promise in a Welsh inn has not been, in my opinion, fulfilled. The author will still "see signs of disbelief on the faces" of his friends. "The eyes of the old man in the corner were wide open and he bore a look of undisguised horror."

B. P. NEOGY.

ANNUAL REPORT FOR 1941 OF THE BENGAL BRANCH OF THE BRITISH EMPIRE LEPROSY RELIEF ASSOCIATION—Published by the Bengal Branch of the Indian Council of the British Empire Leprosy Relief Association, 94, Chittaranjan Avenue, Calcutta.

During the year under review, the Bengal Branch of the British Empire Leprosy Relief Association has adopted the policy of sending leprosy officers to different districts with a definite programme of work, which included an intensive survey of small areas preferably around leprosy clinics, short courses of training for doctors, leprosy survey and propaganda work in schools, and propaganda work for the general public. New propaganda methods have been adopted which included lectures on leprosy accompanied with lantern slides, propaganda in health exhibitions, and radio talks.

In Calcutta, the problem of leprosy among the begger population was personally investigated by a leprosy officer. The findings of this work so far indicate that while leprosy among the beggars in Calcutta and suburbs may number 1,000, the number of cases in the general population is probably ten times this figure, and that a considerable number of the cases are infectious. This is a significant point.

The financial position of the Bengal Branch of the Association so far remains sound, but if the work is to be continued on the present scale, additional funds will be needed later.

A. GUPTA.

REPORT ON LEPROSY AND ITS CONTROL IN INDIA—By the Committee appointed by the Central Advisory Board of Health, Government of India. 1941.

The Committee met at New Delhi in October 1941, and its conclusions and recommendations are contained in the report.

The report begins with the historical aspect of leprosy in the world as a whole, and then deals with various problems connected with the disease and its control in India. All relevent points such as, the cause and spread of leprosy, a study of the infective and non-infective cases, the problem of beggars with leprosy, leprosy as a social problem, leprosy as a medical problem, legislation and leprosy, evaluation of anti-leprosy treatment, the present position of anti-leprosy work in India, research work in leprosy etc., have all been discussed in a most practical and lucid manner.

Sufficient stress has been laid upon adequate teachings of leprosy in medical schools and colleges throughout India. Every doctor should know how to diagnose and treat leprosy, and what precautionary measures should be taken against its spread.

The pamphlet consisting of not more than 70 pages, will be an easy reading for all interested in leprosy work—members of the medical profession as well as the general public.

A. GUPTA.

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*"RECENT ADVANCES IN MALARIAL THERAPY" by Dr. Menino De'Souza, B.Sc., M.D. Medical Bulletin, Vol. VII, No. 19, Oct. 7, 1939.

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ASSOCIATION NOTES

KISTNA DT. MEDICAL ASSOCIATION (KISTNA BRANCH, I.M.A.)—Monthly meeting held on 25-4-42 at the Government Head Quarters Hospital, Masulipatam with Dr. N. N. Sujeer, President, in the chair. 40 doctors attended. The minutes of the last meeting were passed.

Read and recorded the following:—letter No. 7/42 dated 6-4-42, of the Secretary, Vizagapatam Branch of I.M.A.; letters No. 88 and 89, dated 15-4-42, of the Hony. General Secretary of I.M.A., Calcutta; letter dated 22-4-42, of Dr. Pattabhi Seetaramayya Garu, Masulipatam; letter dated 25-4-42, of the Hony. Secretary of the Andhra Provincial Branch, Masulipatam.

Read letter No. 90 dated 15-4-42, of the Hony. General Secretary of I. M. A., Calcutta, and resolved to bring it again before the next General Body Meeting.

Sri. P. Kanakaraju Pantulu, Special A.R.P. Officer, Masulipatam, addressed the gathering for helping him in supplying a casualty officer and a medical officer for the First Aid Post for Masulipatam and Dr. M. V. Subbarao invited the attention of the members to an interesting article on air raid casualties and treatment from the I.M.A. Journal and supplemented it with information regarding the treatment of phosporus burns and mustard gas casualties.

Dr. M. V. Subbarao read two interesting case notes of (1) Clinical Enteric and (2) Arteriovenous Aneurysm of the Femoral Vessels.

TANJORE DT. MEDICAL ASSOCIATION (TANJORE BRANCH, I.M.A.)—The Annual Meeting held on 29-3-42 at the Medical School buildings, Tanjore. About 85 members attended.

The function commenced at 9 a.m. with Dr. A. J. John, the President of the branch, in the chair with a prayer. The minutes of the last meeting were read and adopted. This was followed by the presentation of the annual report for year 1941 which was adopted.

The following office-bearers were elected for 1942:

President—Dr. A. J. John, *Vice-President*—Dr. Md. Ismail, *Secretaries*—Drs. N. Ramanathan and T. B. Shankar Rao, *Committee Members*—Drs. N. R. Subramaniam, V. P. V. Naidu E. K. Menon, P. Narayana Rao, L. T. Appadurai and Miss Fernandez.

The following resolution was passed: "In view of the financial condition of the Association, it be resolved that the annual subscription of the Association be enhanced by Re. 1/- only *i.e.*, from Rs. 2/- to Rs. 3/-."

At the end of the business meeting, Rao Bahadur Dr. T. S. Tirumurti, M.B. & C.M., D.T.M. & H. was proposed to the chair as President of the day.

In the course of his presidential address, Dr. Tirumurti congratulated the Association for having become a branch of the Indian Medical Association. He explained to the members the importance of an All-India organisation at the present time; how newer problems were facing the medical profession, especially, with the influx of many evacuees from overseas carrying with them not only the horrors of war but also certain diseases, which might not have been known in our places. He emphasised the importance of village hygiene and rural medical relief, since rural areas are the centres of the thickening of the population. He appealed to the members to co-operate with all the A. R. P. organisations, whether official or unofficial, and render the public all their help. Further, he stressed the value of co-operative medical societies and the scope for Indian pharmaceutical and biological laboratories to spring up at this juncture and bring out substitutes for the many foreign products on which we have relied and are still relying. He envisaged the grave problems that were going to arise from the fall in number of trained medical men and relative dearth of practitioners which would result when all institutions for medical training in cities would have to be closed down, unless the authorities provided facilities for such training in centres which were most likely to be outside the danger zone, and he pleaded that preference should be given to those mofussil towns where there already existed or had existed some medical college or school. Another factor would be to face an increase in epidemic diseases, especially, if it synchronised with a fall in the supply of qualified men, just as the influenza epidemic of the last war. In conclusion, he said that it became urgently necessary to devise ways and means for their solution and planning must be done without delay, if the hardship to the people was to be kept at a minimum.

After the presidential address, felicitations were offered for the success of the function by Dr. Kalamegham on behalf of the Trichy Medical Association, by Dr. B. S. Viswanathan on behalf of the Coimbatore District Medical Association, and by Dr. M. V. Natesan on behalf of the Madura District Medical Association as well as the South Indian Provincial Branch of the Indian Medical Association.

Dr. A. J. John, the President, replied suitably on behalf of the Tanjore District Medical Association.

This was followed by a paper by Dr. K. V. Venkatraman of the King Institute, Guindy, on Virus Influenza, wherein he dealt with the characterisation of a pure type of virus infection of influenza as distinct from the bacillary type of influenza bacillus which is now recognised to be responsible for other complications of influenza-like pneumonia. He pointed out that the virus influenza was of two types, A & B, and that the A type was probably responsible for the epidemic of 1918, and that the virus is capable of undergoing mutation. He pointed out that the virus influenza is capable of producing some amount of immunity response like any other virus infection and that some work is being done in obtaining prophylactic inoculation on large scale, especially in the face of epidemics of influenza, as in the last war. Herein he stated that the virus B influenza and canine distemper vaccine in combination was found more effective, but, whatever it may be, he said that prophylaxis will be more useful, if the virus of the first case is isolated and vaccine prepared therefrom. He said that there is always a cycle of events going on, and, as such, there is every likelihood of another epidemic of influenza breaking out in near future. He stated that the authorities were fully alive

to such a situation and were getting ready to face it. A small discussion followed and Dr. Venkataraman replied suitably.

The President then gave some anecdotes from his own inexhaustible experience of medico-legal and insurance work and stressed how in preparing a *post mortem* certificate, one must stick to truth and not permit himself to be swayed by any one in the discharge of his duty and how, above all, he must be true to himself and to the cause of justice.

At the afternoon meeting Dr. K. Kannan Nambair, Civil Surgeon, Negapatam, delivered an interesting lecture on Gunshot Injuries and their Medicolegal Significance.

After tea, Dr. B. V. Viswanathan, L.M.S., T.D.D., of the Perundurai Tuberculosis Sanatorium read an interesting paper on Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis. A short discussion followed.

In winding up the proceedings, the President, Dr. T. S. Tirumurti, congratulated and thanked the various lecturers of the day on the fine exposition of their subjects. The following resolutions were passed unanimously:

I. The members of this Association are proud to learn that Dr. B. C. Roy, one of the leaders of the medical profession, has been appointed Vice-Chancellor of the Calcutta University and offer their hearty congratulations to him.

II. The members are proud to learn that Rao Bahadur Dr. A. Lakshmanswami Mudaliar, one of the leaders of the medical profession in the presidency of Madras, has been admitted as a fellow of the American College of Surgeons and offer their hearty congratulations to him.

The Secretary was authorised to send a copy of the above resolutions to the respective doctors.

The meeting then terminated with a vote of thanks to all the distinguished visitors of the day and to the President, in particular.

EXTRACTS FROM THE ANNUAL REPORT FOR 1941, AS PRESENTED BY THE JT. SECRETARIES:

"*Membership*—There were 143 members on the rolls of the Association as compared to 120 of the previous year. There are still some members of the profession who have not as yet enrolled themselves as members and we request them all to join us so that the profession of the district is combind in one solid and united body.

The year under review has been one of a few achievements. The one and most important is that, by a resolution passed at its meeting on the 19th July, 1941, the Association was converted into a Branch of the Indian Medical Association and received formal recognition as such commencing from the 1st October, 1941. Of our old members, only 65 have become enlisted to the Indian Medical Association. We trust and request that all the remaining members will enlist themselves in due course and early.

Meetings—There were in all eleven monthly meetings for the year under report, and two meetings of the managing committee.

A detailed statement of the meetings is given:

SUMMARY OF MEETINGS HELD DURING THE YEAR 1941:

30-3-41—Dr. S. K. Sundaram, B.A., M.D.—*Cardiac Irregularities;* Dr. K. K. Nambiar, B.A., M.B.B.S.—*Professional Mistakes in my Experience*—(Association).

27-4-41—Dr. R. Kalamegham, B.A., M.B.B.S.—*Injuries of the Elbow Joint and their Treatment*—(Association).

24-5-41—Dr. R. Shanmugam, M.B.B.S., D.T.M.—*Physical Signs in Clinical Surgery*—(Association).

21-6-41—Dr. C. H. Venkateswar, M.B.B.S.—*Some General Principles in the Treatment of Diseases of Children*—(Dr. C. H. Venkateswar).

19-7-41—Dr. Mohammad Ismail, M.B.B.S., D.T.M.—*Some Common Affections of the Rectum and Anal Canal.*—(Dr. N. R. Subramaniam).

28-9-41—Dr. N. R. Subramaniam, M.B.B.S.—*Some Recent Advances in Medicine*—(Dr. T. B. Shanker Rao).

26-10-41—Dr. A. J. Jonh, M.B.B.S.—*Some Surgical Conditions of the Male Urethra*—(Dr. N. Ramanathan).

22-11-41—Dr. U. V. Srikanteswaran, M.B.B.S., L.O.—*Some Common Diseases of the Eye*—(Dr. A. J. John).

20-12-41—Dr. V. K. Ramachandran, M.B.B.S., T.D.D. (Madras)—*The Principles of Treatment of Pulmonary Tuberculosis*—(Dr. V. P. Venkatakrishna Naidu).

24-1-42—Dr. N. Ramanathan, M.B.B.S.—*Abscesses of the Lung*—(Dr. P. Narayana Rao).

21-2-42—Dr. K. S. Appu Mudaliar, M.B.B.S.—*Anæsthesia in Surgery*—(By committee of hosts of R. M. Hospital, Tanjore).

We will be failing in our duty if we do not express our sincere thanks to the various members and others who have been our hosts at the social gatherings of the monthly meetings.

General—We take this opportunity of thanking the various lecturers who had addressed us during the year, and we should thank, particularly, our distinguished guests of today's function for the trouble they have taken to be present here today and contribute to the success of today's function. We will be lacking in our duty if we fail to record the good services rendered to our Association by Dr. C. H. Venkateswaram during his short term of office as Secretary. We thank the District Medical Officer for the use of the Hospital buildings where our meetings are held and for the keen interest he evinced in the welfare of our Association."

CALCUTTA BRANCH—Meeting of the Executive Committee held on 7-4-42 at 7-30 p.m. at the Association Hall with Dr. B. Mitra in the chair:

The proceedings of the last meeting were read and confirmed. The statement of accounts for the month of March, 1942, was inspected. The report of the Social Functions Sub-committee was read and confirmed. The report of the Sports Sub-committee was read. The Convener of the Sports Sub-commitee made certain remarks regarding organising Table Tennis Tournaments at the present time. After some discussion, the report of the Sports Sub-committee was recorded.

A letter dated 24-3-42 from the Secretary, Doctors' Amusement Club, re: reduction of rent, was placed before the house.

Resolved that the annual rent be reduced to Rs. 120/- only from January, 1942, till the present economic condition returns to normal and so long as the concession is allowed by the landlord.

The statement of outstanding subscriptions for the last session (1940-41) was placed before the meeting. Resolved that the names of those members who have refused to pay their subscriptions be sent to the Central Office for necessary action, and a reminder be sent to others to pay up their dues without further delay.

Regarding the application of the office staff for advance payment of their wages for two months, it was resolved that the Secretary be authorised to do the needful in the matter.

It was proposed to prepare a list of furniture and other belongings of the Association, and send a copy of the same to the nearest A. R. P. Warden.

With a vote of thanks to the Chair, the meeting terminated.

KISHANGANJ BRANCH—Meeting of the Executive Committee held on 9-5-42.

Proceedings of the last meeting were confirmed and the accounts for the month of March and April passed.

Resolved that the following books may be purchased for the library: (*a*) Clinical Obstetrics by Mudaliar and (*b*) Common Skin Diseases by Roxburg.

Resolved that the resolution No. 4 of the Hyderabad conference and No. 56 of the fifth meeting of the Working Committee at Delhi, be discussed at the next General meeting to be held on 27th May, 1942.

Resolved that letter No. C-90 from Head Quarters be discussed at the next General meeting and a Sub-committee be formed for the Ethical Advisory Board.

RAMNAD DT. MEDICAL ASSOCIATION (RAMNAD BRANCH, I.M.A.)—Meeting of the Council. The following draft resolutions on the subject of Insurance Medical Examination, sent by the Provincial Branch, were circulated to members for opinion:—

"1. Resolved that Insurance companies in India shall recognise a panel of qualified and registered medical practitioners in towns where there is a fairly large number of them and, at the least, one such medical practitioner in rural areas and publish the names of such recognised medical practitioners in the Journal of the Indian Medical Association.

2. That persons, not so recognised, should not be permitted to examine cases.

3. That the Insurance Companies should send strict instruction to their agents to take the cases only to those medical men recognised by the Company by rotation in the locality, thereby preventing unfair collusion between the doctor and the agent to the detriment of the Companies' interests.

4. That the Insurance companies shall instruct their agents to have their cases examined only in the consulting room of the doctor in stations where such possibilities exist.

5. That the Insurance Companies do not employ medical men from outside to examine cases in stations where local practitioners are available. If those local practitioners have not upto now been recognised, they must now be included in their panel of doctors, as early as possible, as these measures will ensure thorough examination of the insured and will enable the local doctors who are expected to know the nature of the health of the individual concerned better than a practitioner from outside. The Head Office may, however, in special circumstances, direct the agent to take the cases to any particular doctor other than the one in the locality. Such instances must, however, be very much restricted.

6. That the Insurance Companies shall fix the fee of the doctor examining the cases at the uniform minimum rate of Rs. 10/- per case, as the Association is of opinion that a medical man cannot devote sufficient time to conscientiously examine these cases for less than that fee.

7. That the Insurance Company should take serious notice of complaints made against their agents by medical men in the discharge of their duties.

8. That the Insurance Companies shall appoint only lady doctors, where they are available, for examining lady proponents, except in those cases where the lady proponent declares in writing that she has no objection to be examined by a male doctor, as the Association is of opinion that the examination of a lady proponent with a nurse is a mere farce."

The Council, in considering the above resolutions, resolved that they may be circulated to the local branches for opinion and the matter be placed before the next meeting of the Branch.

The Council noted that Dr. T. S. Tirumurti, President, South Indian Provincial Branch of the Indian Medical Association, had made a suggestion recently to the members of the Tanjore District Medical Association that the Association would be well advised to take necessary steps for the registration, with all necessary particulars, of Indian Evacuees from Overseas, Hongkong, Malaya, Singapore,, Burma, Ceylon and other places who might go to the doctors for treatment.

The District Medical Association may nominate one member of the Association of each place to maintain a register of such evacuees and send a copy of the list from time to time to the Secretary of the District Medical Association, who will thus be enabled to maintain a complete record of such evacuees.

The object is to render social service and endeavour, through Oorkappu Sangam, Social Service League and such other institutions, to give financial help to deserving cases. It should also be made known in the general notification for registration that every one of the members of the District Medical Association will be glad to offer free medical advice and such other help as is possible to the poor evacuees.

The Council felt that it will redound to the credit of the Ramnad District Medical Association to move in this matter immediately and thus set an example to other District Associations.

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The following resolutions were passed at a meeting of the Ramnad Branch at its meeting on 26-4-42:

Re: Insurance Medical Examination:—

Resolved that the Association is against such a panel of only a few doctors: but it has no objection if all registered

medical practitioners belonging to that particular area are included in that panel and the medical examinations are done by rotation so that every body has the benefit.

Resolution No. 2. falls through being dependent on the first resolution.

Resolution No. 3 also falls through as it is also dependent on resolution No. 1.

Resolutions No. 4, 5, 6 and 7 passed unanimously.

Resolution 8.—The Association does not appreciate the contention that the examination of a lady proponent by a male doctor with a nurse is a farce: hence it is of opinion that, in cases where the proponent does not by herself object to being examined by a male doctor, it sees no reason why she should not be examined.

Considering the present economic depression and increased cost of living and the extra work thrown on the Honorary Medical Officers on account of the unsettled conditions due to war, this Association requests the Government to pay an honorarium of at least Rs. 125/- per mensem to them in all the places in the Presidency as is done in Madras and Vizagapatam.

Dr, T. S. Tirumurti's suggestion was approved.

SEWAN BRANCH—Emergent meeting held on 12-5-42:

1. Considered Sub-Divisional Officer, Sewan, letter no. 1497 dated 12-5-42.

Resolved that, as per letter no. 1497 dated 12-5-42 of the Sub-Divisional Officer, Sewan, re: deputation of doctors, compounders and dressers at Ry. Station, Savan, to attend the wounded soldiers, the members will be on duty to accompany the Assistant Surgeon to attend cases in special trains, according to the time, mentioned against their names. The duties will be in cyclic order as per list. It will take effect from to-day.

Resolved that a copy of it be forwarded to the Sub-Divisional Officer, Sewan, with the request that, as the duty roster is being placed at the Secretary's place, intimation with conveyance should be sent to his place, as per letter under reference.

Resolved that the question of supply of compounders and dressers in stringent days be left to the Sub-divisional Officer.

Resolved that the duty roster be maintained at the Secretary's place and the Secretary be requested to forward a copy of it to each of the members weekly and to inform in time to enable them to attend their duty.

Resolved that suggestions be forwarded to the Sub-Divisional Officer that the local Homœopaths, Hakims and Vaidyas should be requisitioned as assistants to the persons on duty.

MADURA MEDICAL ASSOCIATION (MADURA BRANCH, I.M.A.)—Meeing held on 28-3-42 at the Erskine Hospital, Madura:

48 doctors attended the meeting with Lt. Col. A. I. Cox, I.M.S., President of the Branch, in the chair.

The minutes of the previous meeting were adopted.

Mr. V. R. S. Mani of Rangoon spoke on his experience of the air raid on Rangoon. He gave a detailed account of the first few raids on Rangoon and how the civilians reacted to them. He stressed the importance of taking cover during a raid. He also criticised the way in which places, unfrequented by people, and vast open spaces are chosen for slit trenches. He said that the shelters provided on the pavements on the sides of roads by raising a wall offered very good protection. He also suggested that the A.R.P. authorities should enlist the co-operation of the private practitioners to the fullest extent. At the end, a number of questions put by the members were answered by the lecturer.

The chairman, in his concluding remarks, after thanking the lecturer, said that, inspite of the critical times that they were having, only 10 practitioners had till then volunteered for A.R.P. work and he made a vigorous appeal for many more to come forward.

The Secretary said that, in the matter of medical men volunteering for A.R.P. work, the fault lay with the A.R.P. authorities in not taking into confidence the Medical Association in organising medical relief. On behalf of the Association, the Secretary took the opportunity to bid farewell to Dr. Miss A. D'Cruz who had been transferred to Tinnevelly.

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Meeting held on 3-4-42 at the Erskine Hospital, Madura, with Rao Sahib Dr. A. Narayana Menon in the chair:

The minutes of the previous meeting were read and adopted.

Dr. A. S. Annamalai then read a paper on Limb Injuries. He dealt with, in detail, the importance of treating large lacerated wounds, compound fractures, joint wounds etc. by the closed plaster technique and application of the same in burns of limbs to prevent contractures. He also dealt with the syndrome of crushed injuries with renal failure, wound infections like gas gangrene etc. and amputation—indications and technique.

At the end of the lecture, a few questions put by the members were answered by the lecturer.

Capt. C.S.S. Sarma suggested that, at the end of this series of lectures, a summary of the lectures be printed and distributed to the members.

With the concluding remarks of the President and a vote of thanks by the Secretary, the meeting came to a close.

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Meeting held on 18-4-42 at the Erskine Hospital, Madura, with Lt. Col. A. I. Cox, I.M.S. in the chair:

The minutes of the previous meeting were read and adopted.

Dr. K. Krishna Bhat read a paper on Shock. He dealt with the ætiology, pathology, prognosis and treatment of both primary and secondary shock. He stressed the importance of the prophylactic treatment of secondary shock. He made an appeal to maintain a clinical record of all cases for future guidance and knowledge.

Dr. C. B. Gopalakrishna read a paper on Blood Transfusion and Serum Bank. He dealt with the indications for the various transfusions and technique of collecting and storing blood sera and also their administration. He made a vigorous appeal to the medical men to come forward as donors and pave way for others. At the end, a few questions put by the members were answered by the lecturer.

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Meeting held on 24-4-42 at the Erskine Hospital:

32 doctors attended the meeting which began after 'Tea'.

In the absence of the President and the Vice-President, Dr. E. W. Wilder was voted to the Chair.

The minutes of the previous meeting were read and adopted after a suggestion from Capt. Sarma to delete the last para. It was decided to do so after consulting the President.

Then Dr. C. S. Pandithurai read a paper on Burns. He dealt with the causation of burns by different means, their course and treatment. He also dealt with shock in burns and its treatment. Capt. C. S. S. Sarma, Dr. Wilder and the lecturer took part in the discussion that followed.

With the concluding remarks of the President and a vote of thanks to the chair, the meeting terminated at 7 p.m.

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Meeting held on 30-4-42 at the Erskine Hospital, Madura, with Lt. Col. A. I. Cox, I.M.S., in the chair:

The first lecture was by Dr. P. Vadamalayan on Wounds of the Chest. He described the different external and internal injuries of the chest caused by missiles, falling masonary, bullets., etc., and the treatment of the same.

Then Capt. C. S. S. Sarma spoke on Wounds of the Abdomen and Pelvis. With the aid of a case sheet and a chart, he stressed how fatal these abdominal injuries are and what an amount of time it takes for one to completely recover.

A few questions put by the members were answerd by the lecturer.

The President, in his concluding remarks, stressed the importance of clearing the throats of those with chest injuries. He also suggested that every one of us should provide ourselves with the necessary things to handle cases of abdominal injuries in our dispensaries, rather than wait for such cases to be sent over to hospitals.

With a vote of thanks to the chair the meeting came to a close at 7 p.m.

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Meeting held on 6-5-42 at the Erskine Hospital with Lt. Col. A. I. Cox, I.M.S. in the chair:

Dr. P. G. Menon read a paper on Injuries of the Ear and Face. Lt. Col. Cox then delivered an interesting lecture on Cranial Injuries. Dr. P. V. Anantanarayana Iyer spoke on Injuries of the eye.

These were the concluding lectures in the Air Raid Injuries series of lectures.

BENGAL PROVINCIAL BRANCH—Meeting of the Bengal Provincial Council held on 21-3-42 with Dr. P. K. Banerji (Howrah) in the chair:

The proceedings of the previous three meetings, as circulated, were read and confirmed.

The statement of accounts for the month of February, 1942, as circulated, was inspected.

Dr. S. N. Banerji read out his report in connection with the allegation against Dr. S. N. Basu of Jalpaiguri Branch. Resolved that a letter be addressed to the Registrar, Bengal Council of Medical Registration, enquiring about their decision regarding the case of Dr. Basu which had come up before them. Resolved further that letters be also sent to Dr. S. N. Basu and to the Secretary, Jalpaiguri Branch, enquiring if they had received any communication from the Bengal Council of Medical Registration regarding this case.

A letter dated 30-11-41 from the Hony. General Secretary, I. M. A., forwarding copy of a letter dated 17-10 41 from the Secretary, Muzaffarpur Branch, in connection with the question of travelling allowance for members attending Central and Provincial Council Meetings, was considered.

While endorsing the general principle of the letter, the Bengal Provincial Council is of opinion that consideration of such constitutional changes may be deferred till after the present emergency caused by the war, is over.

The report of the Standing Committee concerning (civil) emergency medical service conditions in Bengal, as circulated, was adopted and the Standing Committee was requested to draw up the details.

Members of the Emergency Medical Service Standing Committee were authorised to see the Surgeon General, Bengal, if asked to do so by the S. G.

A letter dated 10-3-42 from Dr. B. K. Rai Chowdhury of Asansol Branch, was placed before the house. Resolved that the letter be referred to the Provincial Standing Committee.

A letter dated 21-3-42 from the Hony. Secretary, Indian Provincial Medical Services Association (Bengal Branch) re: affiliation of the said body to the I. M. A., Bengal Provincial Branch, was placed before the meeting.

Resolved that the matter be put up in the agenda of the next meeting of the Provincial Council and, in the meantime, the following members be requested to meet and discuss about the feasibility of the proposition and also to go into the details of the necessary constitutional changes: Drs. P. K. Guha, A. K. Sen, P. Chatterjee, T. N. Ghosh, K. K. Sen Gupta, Banbehari Banerjea.

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Meeting held on 18-4-42, at 3 p.m. at the Association Hall, Calcutta, with Dr. Subodh Datta in the chair:

1. The proceedings of the last meeting, as circulated, were read and confirmed.

2. The statement of accounts for the month of March '42, as circulated, was inspected.

3. The formation of a branch at Brahmanbaria within the district of Tippera, with five members was recorded.

4. The findings of the sub-committee appointed to consider a letter dated 21-3-42 from the Indian Provincial Medical Services Association (Bengal Branch) re: granting affiliation to the said body, were placed before the house, and were approved and recorded.

5. The discussion about the formation of a new branch at Howrah under the name of "North Howrah Medical Society" was postponed in view of the constitutional question involved, as pointed out by the Hony. Genl. Secretary, I.M.A. in his letter dated 12-4-42 to the Hony. Secretary, North Howrah Medical Society.

6. Resolved that Provincial Council meetings be held henceforth on the first Monday of every month at 6 p.m.

7. A letter dated 20-3-42 from the Secretary, Hooghly-Chinsura & Chandernagore Branch re: un-asked for leave to Dr. Miss L. Roy from the Imambarah Hospital for two months, was placed before the house.

After some discussion, it was decided that the matter be put up before the next meeting of the Provincial Council (in May, 1942) ; and, in the meantime, the Secretary of the Hooghly-Chinsura & Chandernagore Branch be written to with an urgent request to furnish the Provincial Council with the following informations:—(1) the proceedings and the findings of the special general meeting which the Branch was to have held in this connection, (2) Copies of the letters (or applications) made by Dr. Miss Roy to the Civil Surgeon, and (3) whether Dr. Miss Roy has been allowed to re-join after her leave, if so, on what date and after what period of leave.

8. The report of the Standing Committee in respect of the matter arising out a letter dated 10-3-42 from Dr. B. K. Rai Chowdhury of Asansol Branch, was accepted and it was decided to take necessary action, as recommended.

9(*a*) A report was read out by Dr. A. K. Sen, representative of this Association to the Blood Bank Committee of the Indian Red Cross Society, Bengal Provincial Branch. Dr. Sen's suggestion was accepted. It was decided that Dr. J. C. Banerjea, Dr. Subodh Datta, Dr. Charubrata Ray, Prof. B. P. Tribedi, Dr. Harendra Nath Mukherjee and Dr. A. K. Sen would form a Technical Sub-committee to go into the details and do the necessary propaganda work. Dr. Sen was made Convener of the above sub-committee.

The following resolution moved by Dr. A. K. Sen, was accepted by the house:—

(*i*) The Bengal Provincial Council of the Indian Medical Association recognises the call upon the people of Bengal for the supply of sufficient number of voluntary blood donors with a view to build up adequate reserve in Blood Bank as an essential factor in the civil defence designed to prevent or alleviate the medical and public health hazards to which the civilian population of Bengal are exposed in cases of air raids and is of opinion that a complete and detailed scheme is required for all the vulnerable areas of Bengal.

(*ii*) It welcomes the activities of the Blood Bank Committee, Indian Red Cross Society, Bengal Provincial Branch, in this line and appreciates the draft circular letter (copy enclosed) attached to the letter of Dr. J. B. Grant dated 14-4-42 addressed to the Secretary, Indian Medical Association (Bengal Branch).

(*iii*) The Council requests all its constituent branches, medical institutions and members of the medical profession in general, all over Bengal, to take up the important question of establishment and maintenance of branches of the Blood Bank in their respective areas, especially, in and near vulnerable zones. It also requests all medical institutions and organisations to actively assist the Blood Bank Committee in educating the public by way of lectures, discussions and practical demonstrations regarding the utility of blood transfusion as a therapeutic measure—sometimes the only life saving measure—of vital importance in the treatment of shock in most cases of air-raid casualties. It must be made perfectly clear to the volunteer-donors, by practical demonstrations on the responsible leaders of such medical institutions and organisations, that a reasonable amount of blood-letting is not injurious from the medical point of view.

9 (b) *Re: E. M. S. Standing Committee:*

The Secretary informed the house that the "Skeleton Scheme on Medical Aspects of Civil Defence", prepared by the E. M. S. Standing Committee, had been sent to the Government authorities concerned for their consideration. In reply, the Surgeon General with the Government of Bengal invited the members of the Standing Committee to a meeting held on 1-4-42 at 2-30 p.m. at the S. G.'s office when the S. G. proposed to place the Govt. scheme for dealing with casualties and invited the I. M. A. to make suggestions and to discuss how the I. M. A. could best co-operate with the Government. Accordingly, the Committee met at the S. G.'s office on 1-4-42. A brief report of the proceedings of that meeting (copy enclosed) was read out.

Arising out of the report of the Standing Committee, the Provincial Council was informed that a copy of the complete and detailed scheme of the Government had not been received from the Surgon General, as promised by him, till that time; and also that a reminder had already been sent to the Surgeon General to send a copy of the Government scheme as early as possible. In this connection, Dr. A. K. Sen moved the following resolution which was adopted unanimously:—

"The Bengal Provincial Council of the Indian Medical Association recognises the call upon medical services in case of air raids as a cardinal factor in such an emergency, and is of opinion that a complete and detailed scheme is required providing for the medical and auxiliary personnel, the institutions, equipments, communications, and transport entailed, and demands that both policy and administration shall be devised without delay and carried out under responsible co-operation between the Indian Medical Association and other representatives of the medical profession and of the hospitals with the several Government departments concerned."

10. It was resovled that the Calcutta Branch of the I. M. A. be approached for a proportionate reduction of house rent with retrospective effect from January, 1942, in view of the present abnormal circumstances.

11. (*a*) A letter dated 7-4-42 from the President, I. M. A., was read out. It was decided that a suitable letter in reply be sent to the President, I. M. A., and the same be drafted by the Secretary in consultation with the Chairman of to-day's meeting.

(*b*) Copy of a letter dated 3-4-42 from the Hony. General Secretary, I. M. A. to the Secretary, Howrah Medical Society, re: enrolling two classes of members, one set joining the I. M. A. and the other remaining outside it, was read before the meeting. The letter stated that such enrolment was not permissible under the rules of the I. M. A. Resolved that the letter be recorded.

(*c*) Letters in connection with the case of Dr. S. N. Basu of Falakata Charitable Dispensary, Jalpaiguri, received from the Registrar, Bengal Council of Medical Registration, from the Secretary, Jalpaiguri Branch, and also from Dr. Basu

himself, were read before the house. Resolved that the letters be recorded and due publicity should be made in the matter in consultation with the Chairman.

With a vote of thanks to the Chair, the meeting terminated.

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Copy of a draft circular letter to be issued by the Surgeon General with the Government of Bengal, Chairman, Blood Bank Committee, Indian Red Cross Society, Bengal Provincial Branch [vide Resolution 8 (ii) above].

A self-explanatory statement is enclosed of the purpose and organisation of the Blood Bank, Bengal Provincial Branch, Indian Red Cross Society. We are anxious to explore the possibility of your institution undertaking the responsibility of enlisting volunteers. It is hardly necessary to point out that self-protection requires the immediate building up of a reserve sufficient to meet contingencies. This reserve can be assured only if every organisation undertakes to discharge its own responsibility. The procedure suggested would be as follows:—

The Bank located at 110, Chittaranjan Avenue, Calcutta, would undertake the separation and preparation of serum and, also, if desired, of sending teams to your institution to take the blood from volunteers. If your hospital itself is in a position to bleed the volunteers, the Bank would supply any desired equipment as well as instructions for the collection and despatch of the blood to the Bank.

The ideal storage of serum is between 4°-6°C. The Bank would return 50% of the blood processed for use in case of emergency and would be prepared in case of an air raid to provide additional quantities in terms of your needs.

It is hoped that this matter may receive your prompt attention. The Indian Medical Association will assure that its local branch will render any assistance possible in educating the public in helping to enrol volunteers.

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Abstract proceedings of a meeting of the E. M. S. Standing Committee with the Surgeon General to the Government of Bengal, held 1-4-42 at 2-30 p.m. at the S. G.'s office [vide Resolution No. 9 (b) above.]

At the beginning General Paton informed the representatives of the I. M. A. that the Liaison Committee was also invited at this meeting.

On behalf of the I. M. A. (Bengal Branch), Dr. A. K. Sen informed the S. G. that the Liaison Committee met at the I. M. A. last night and wrote to him regretting their inability to attend this meeting. He added that the E. M. S. Standing Committee was appointed by the I. M. A. to formulate a comprehensive scheme on Medical Aspects of Civil Defence for Bengal whereas the Liaison Committee was appointed by the members of the medical profession to act as a Liaison body between the Government department of Civil Defence Co-ordination and the medical profession.

Dr. Sen continued that, as desired by the S. G., the Standing Committee met to discuss the Government scheme and the I. M. A. scheme on medical aspects of Civil Defence. He explained the various aspects of the I. M. A. skeleton scheme and especially stressed the urgent necessity of planned dispersal of the medical personnel, equipments, etc., as done in England.

General Paton then said that he had gone through the I. M. A. scheme and liked it. But he said there were various practical difficulties in putting such a scheme into effect. He admitted that the present Government scheme was not an ideal one, but, considering the peculiar local circumstances here as contrasted to those of England, it was a fairly good and practical one. He then narrated the important details of the Casualty and Hospitals Services in the Government Scheme. Dr. Ahmed requested General Paton to send a copy of detailed Government scheme to the I. M. A. and to give wide publicity to the details of the skeleton scheme so that the medical and lay public might be convinced that adequate medical arrangements were being made by the Government to cope with the air-raid casualties.

On being questioned by Dr. Sinha, General Paton explained why the name 'Emergency Medical Service' replaced 'A. R. P. Service' in the 'A' class A. R. P. Hospitals in Calcutta. The change of name, he said, was in the interests of medical men as otherwise they would have been required to wear uniforms and undergo such other formalities and restrictions imposed by the A. R. P. regulations. He added that the term E. M. S. had nothing to do with the military side and the service was not transferable.

On being questioned by Dr. Guha, he said that the hospital part of the scheme was already put into effect and the appointment of medical officers in a hospital would have retrospective effect from the date that particular hospital received the order of appointing such officers.

A detailed discussion then followed regarding the feasibility of establishing Base Hospitals in Bengal, as outlined in the I. M. A. scheme. General Paton remarked that as Burdwan was wihin the vulnerable zone, it could not be a suitable place for a Base Hospital. At Jalpaiguri, he said, there were no suitable buildings near the existing hospital and Bankura did not have first class staff or equipment. The question of transport difficulties was of great importance as there were no ambulance trains available for civil casualties. He was however negotiating with the authorities in C. P. and U. P. regarding accommodation of patients from Bengal in their well equipped hospitals, if the occasion demanded such a measure. Dr. Sen and Dr. Guha pointed out that the Government of Bengal should at least disperse some of the expensive appliances, *e.g.*, x'ray apparatus, physiological and pathological laboratories and museums, etc. General Paton appreciated the suggestion and explained the financial and other difficulties in the matter.

General Paton invited the Committee to visit Government First Aid Centres and to suggest improvements regarding the same. He said he expects the I. M. A. to supply fairly senior doctors with proper surgical training for the posts of Resident Surgeons for the following A. R. P. Hospitals:—

1. At Uttarpara (700 beds) at Rs. 500/- p.m.
2. At Barrackpore (400 beds) at Rs. 400/- p.m.
3. At Behala (350 beds) at Rs. 400/- p.m.

4. At Chandernagore (300 beds) at Rs. 350/- p.m.
5. At Lake Club (150 beds) at Rs. 350/- p.m.

General Paton then said that he was glad to meet the representatives of the I. M. A. and requested them to come and meet him as often as necessary.

On behalf of the Standing Committee, Dr. Sen thanked the Surgeon General for his courteous and frank discussion and the meeting terminated at 3-50 p.m.

Members present:—1. Dr. A. K. Sen, 2. Dr. P. K. Guha, 3. Dr. M. U. Ahmad, and 4. Dr. R. Sinha.

DOHAD BRANCH—Annual General Meeting held on 28-11-41:

After the minutes of the last meeting were read, the following were elected office-bearers for the year 1941-42.

1. Rao Saheb Dr. A. S. Barot, M.B.B.S.—Chairman.
2. Dr. H. C. Sheth, M.B.B.S.—Secretary and Treasurer.
3. Dr. D. C. Kadakia, L.C.P.S., Dr. V. K. Phatak and Dr. R. T. Vyas—Members of the Managing Committee.

Dr. Vasavda of Jhalod was associated as a new member. As he resides out of Dohad, he is to be charged one rupee less.

The meeting dissolved after having informal discussions.

* * * * *

Meeting held on 17-4-42:

The members of the Branch were invited by the District Magistrate along with the Medical Officer, Civil Hospital, Godhra, to discuss A. R. P. measures at Dohad.

Suitable arrangements were made to protect against air raids and the members of the local branch were allotted various duties, *e.g.*, charge of first-aid posts and the emergency hospital.

The District Magistrate thanked the members of the local branch for expressing their willingness to take part in A. R. P. measures.

GUNTUR DT. BRANCH—General Body Meeting held on 11-4-42 with Dr. K. S. Subramaniam in the chair:

The following business was transacted after refreshments at 5 p.m.:

Minutes of the previous meeting were read and confirmed.

A condolence resolution on the sudden death of Capt. Y. H. Rao, a memer of the Branch, was passed, all standing.

The Secretary read the printed speeches of the Surgeon General and Governor of Madras to the Medical and Nursing professions of the Presidency to join the War Services, delivered at Madras on 14-3-42.

Dr. C. Ramadas, D. M. S. and D. M. R. spoke on the importance of x'ray in medicine and surgery with demonstration of skiagrams on various medical and surgical cases.

MEERUT BRANCH—Proceedings of the General meeting of the Meerut Medical Association (Meerut Branch, I.M.A.) held on 25-4-42 at 5 p.m. in the Garvie Medical Library Rooms, Town Hall, Meerut, with Dr. Bhupal Singh in the chair:

1. Proceedings of the last General meeting held on 7-7-42, as circulated, were confirmed.

2. Proceedings of the Executive Committee meetings dated 28-2-42, 2-3-42 and 27-3-42 which had been circulated, were taken as read.

Proceedings of the Executive Committee meeting held on 24-4-42 were read for the information of the members and for consideration of the question by the General meeting.

1. Resolved that the resolution of the Executive Committee meeting be accepted.

2. Resolved further that a sub-committee, consisting of the following members, be formed with powers to co-opt to give effect to the above resolution:

1. Dr. S. B. Vyas, Hony. Secretary, 2. Dr. O. Prasad, Hony. Jt. Secretary—Convener, 3. Dr. R. C. Mitter, 4. Dr. (Mrs.) M. W. Seth and 5. Dr. Suraj Bal.

3. Consideration of the circular No. C-83 dated 6-3-42 regarding resolutions passed at the XVIII All-India Medical Conference, was postponed.

4. Consideration of the Circulars No. 17, 18, 19 and 20/41-42 dated 7-4-42 from the U.P. Provincial branch of the I. M. A., Lucknow, was postponed.

5. Dr. (Mrs.) T. Jones read a very interesting and instructive paper on Eclampsia. Drs. R. G. Das, Murarilal, R. C. Mitter and Suraj Bal took part in the discussion.

With a vote of thanks to the Chair, the meeting dispersed.

TINNEVELLY DT. MEDICAL ASSOCIATION (TINNEVELLY BRANCH, I.M.A.)—Monthly meeting held at the Office of the Dt. Medical Officer, Palamcottah, 25-4-42:

After tea, the meeting began under the Presidentship of Dr. T. N. Govinda Aiyar, M.B. & C.M., Vice-President of the Association, at 5-30 p.m. 32 members were present.

The minutes of the last monthly meeting held at Trichendur on the 28th March, 1942, were passed.

Dr. J. T. Moses, L.M.P., Medical Officer, Local Fund Hospital, Srivaikuntam, read a paper on Eczema.

Dr. P. S. Kaiyanasundram, L.M.P., Sub-Assistant Surgeon, Govt. Headquarters Hospital, Palamcottah, read out case notes on Meningomyelitis.

Dr. K. Ramachandra Naidu, L.M. & S., Municipal Assistant Surgeon, Municipal Hospital, Tinnevelly, demonstrated a case of Diffuse Aneurysm of the Arch of Aorta with skiagram.

After discussion by the members present, the President summed up the salient and important features of the cases and their diagnosis in detail.

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